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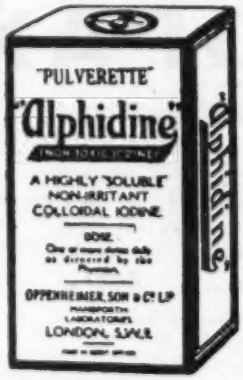
WILLIAM R. WARNER & CO., LTD., POWER ROAD, CHISWICK, LONDON, W.4.

"Alphidine"

(NON-TOXIC IODINE)

The great disadvantage of Iodine Therapy—Iodism—is removed when "Alphidine," the non-toxic, non-irritating Iodine is resorted to. "Alphidine" can be tolerated even in heroic doses.



The toxicity and irritating properties of iodine have done much to circumscribe its use, particularly in old-standing arthritic cases. "Alphidine" opens up an unlimited field in iodine therapy, on account of its non-toxicity and therapeutic activity.

"Alphidine" reacts on the Thyroid and in the words of a well-known clinician, "*It appears to be far more effective in certain forms of hypothyroidism and even myxœdema than Thyroid Gland.*" Another notable feature is its effect in obesity.

CLINICAL SAMPLES AND LITERATURE ON REQUEST

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that the safest and most dependable antacid is

MAGSORBENT

the original and standard brand of

SYNTHETIC HYDRATED MAGNESIUM TRISILICATE

Complete control over gastric hyperacidity is possible, because the action of Magsorbent is continuous and its rate proportionate to the strength of acid present. Even massive doses do not cause alkalosis.

Magsorbent is also a powerful adsorbent of toxins. It not only neutralises but purifies.

Magsorbent is indicated in the treatment of Hyperchlorhydria, Acid Fermentation and Gastric and Duodenal Ulcers.

ITS ACTION IS PERSISTENT SUPPLIED AS POWDER AND TABLETS

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Sole Distributors: **ADSORBENTS, LTD.,** WATERLOO ROAD, LONDON, N.W.2.

To Combat
HEAD COLDS
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NASAL CATARRH

To Ensure
NASAL COMFORT
and
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Colds need not develop. The timely use of 'Benzedrine' Brand Inhaler at the first sign of a cold will often abort the condition entirely. In the acute stages it affords marked symptomatic relief and also helps to prevent the onset of more serious complications such as sinusitis.

Its vapour diffuses throughout the whole upper respiratory tract and reduces congestion in areas that are inaccessible to liquid inhalants. It thus assists in maintaining drainage of the nasal accessory sinuses—an important factor in preventing acute attacks from becoming chronic.

'BENZEDRINE' BRAND INHALER

RAPID IN ACTION CONVENIENT FOR CHILDREN AND ADULTS

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Compound Mandelic Acid Granules

FOR THE TREATMENT OF URINARY INFECTIONS

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Pleasantly flavoured effervescent granules containing mandelic acid and sodium acid phosphate. Neoket is free from the nauseating effects associated with ammonium chloride and as it contains no sugar it is equally suitable for diabetic and non-diabetic patients. Exceptionally good clinical results have been obtained, the urine usually becoming sterile within 8 to 10 days without additional treatment.

Bottle of 6 oz. (approx.) - 10/8½

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Better Salicylate Therapy

WHATEVER be the season of the year, there is a wide sphere of utility for "Alasil," the improved form of salicylate medication. "Alasil" is a very definite advance on ordinary compounds of salicylic or acetyl-salicylic acid both in therapeutic efficiency and in freedom from unpleasant gastro-intestinal sequelæ. This high tolerability is due to the fact that "Alasil" is composed of acetyl-salicylic acid combined with Calcium Phosphate (Bibasic) and "Alocol" (Colloidal Hydroxide of Aluminium), a powerful gastric sedative and antacid.

A careful series of experimental tests has recently shown that "Alasil" is better tolerated and has a greater sedative effect than ordinary salicylate compounds, and that it is practically free from the risk of irritation of the mucous membrane of the stomach. Wide clinical experience anticipated these findings by demonstrating that the use of "Alasil" can be pushed or prolonged to a much greater extent than ordinary salicylate compounds, and that it can be given with equal safety to children, adults, the aged, and patients with finely-balanced digestive capacities.

A supply for clinical trial with full descriptive literature sent free on request.

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Laboratories and Works: King's Langley, Herts.

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ANAHÆMIN B.D.H.

The value of Anahæmin B.D.H. in the treatment of pernicious anæmia is now established. It has been confirmed by observation of many thousands of cases treated both in private and in hospital practice. In this condition the injection of Anahæmin B.D.H. is generally regarded as being the most economic method of producing a normal blood picture, the product being active in minimal dosage at wide intervals.

Anahæmin B.D.H. has been shown also to play an important rôle as an adjuvant to iron in the treatment of certain microcytic anæmias. It is recommended particularly in severe anæmia due to hæmorrhage, either acute or chronic. In this condition '. . . *four weekly doses of an active liver preparation such as Anahæmin 2 c.c. are advisable to stimulate red cell formation*' (Med. Press & Circ., July 3rd, 1940, p. 4).

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THE SAFEST AND MOST SUCCESSFUL CONTRAST MEDIA FOR PYELOGRAPHY

PRODUCTS OF THE GLAXO LABORATORIES

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Brand of IODOXYL INJECTION

For intravenous pyelography. Each 20 cc. ampoule contains in aqueous solution 15 gm. of the disodium salt of 3:5-di-iodo-4-pyridoxyl-N-methyl-2:6-dicarboxylic acid (Iodoxyl). Gives dense, defined shadows. Ampoules in boxes of 1 x 20 cc., 10/6; 5 x 20 cc., 52/6; 1 x 3 cc., 2/6.

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For excretion pyelography and other radiological examinations. Each 20 cc. ampoule contains in aqueous solution 7 gm. of the di-ethanolamine salt of 3:5-di-iodo-4-pyridone-N-acetate (Diodone). For intravenous injection, or can be given subcutaneously when a suitable vein cannot be found. No sloughing follows if 'Pyelosil' escapes into the perivenous tissues. Ampoules in boxes of 1 x 20 cc., 10/6; 5 x 20 cc., 52/6; 1 x 3 cc., 2/6.

Special literature for all the above preparations is available on request.
All prices are tax free and subject to usual professional discount.

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Each adult dose (two teaspoonfuls) contains in acid state :
Sodium Glycerophosphate ... 2 grs.
Calcium Glycerophosphate... 2 grs.
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For Impaired Vitality
AND
Jaded Nerves

Neuro Phosphates has a world-wide reputation for combating nervous exhaustion, lowered vitality, and general debility resulting from prolonged physical or mental strain. It is the ideal reconstructive tonic in convalescence after illness, operation, or parturition.

℞ Neuro Phosphates
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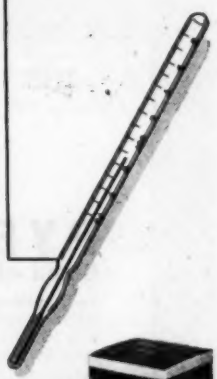
Menley & James Ltd., 123, Coldharbour Lane, London, S.E. 5

N2



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The mild action of 'Petrolagar' helps to relieve bowel distension after surgery and aids in the restoration of normal Bowel Habit Time.

It is pleasant to take and leakage is practically eliminated.

Prescribe 'Petrolagar' for your post-operative and other bed cases. Patients appreciate this contribution to their comfort.

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Regd. Trade mark
BRAND PARAFFIN EMULSION

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In Abortion and Menorrhagia

Progestin B.D.H. is pure synthetic crystalline progesterone manufactured in the Biochemical Laboratories of The British Drug Houses Ltd.; it is identical chemically with the hormone of the corpus luteum of the ovary.

Progestin B.D.H. exerts a specific action in the maintenance of pregnancy in cases of threatened or habitual abortion, and in the relief of hæmorrhage in cases of functional uterine bleeding and menorrhagia, particularly the menorrhagia of puberty. Progestin B.D.H. is thus indispensable in obstetric and gynæcological practice.

A 'B.D.H. Sex Hormone Booklet' dealing exclusively with the clinical application of Progestin B.D.H. in the above and other conditions, the information contained therein being based upon the most recently available reports, will be gladly sent to any practitioner upon request.

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CATGUT

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We wish to inform all concerned that there are ample supplies of A. & H. Catgut available.

Prices and discounts have always been strictly competitive, and we should be pleased to forward, on application, an illustrated price list.

The product complies with the Therapeutic Substances Regulations 1931/37. The entire product is manufactured in England.

MINISTRY OF HEALTH
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BRAND OF CHLOROPHYLL TABLETS

has been before the profession now for fifteen years and has stood the test of time, and the developments indicated point to still greater usefulness for this product in the future"

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A Pamphlet entitled
"Hyperpiesia, Metabolic Disorders, and the Anaemias"
giving laboratory and clinical reports will be sent to Medical Practitioners on request

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SEDATIVES AND HYPNOTICS OF REPUTE

Roche Products Limited are actual manufacturers of a useful and comprehensive series of sedatives and hypnotics. Intensity of action depends upon the dose.

POSOLOGICAL TABLE

PREPARATION	CHILDREN	ADULTS
'ALLONAL' Oral Tablets (a) Sedative doses (b) Hypnotic doses (c) Analgesic dose	*Infants:* ¼ to ½ tablet 2 to 3 times daily *Older children:* ½ to 1 tablet three times daily	(a) One to four tablets in divided doses (b) One to two tablets at bedtime (c) Up to six tablets a day
'OMNOPON' Oral and Hypodermic Tablets Ampoules Injectable Solution 'Tubunic' Ampoule Syringes (a) Sedative doses (b) Hypnotic doses (c) Analgesic dose	*For children above 2 years of age:* Approx. 1/64 gr. for each year	(a) One oral tablet or one ampoule (gr. 1/6 to gr. 1/3) (b) (c) Two oral tablets or two ampoules. Maximum dose: gr. 1. In one day gr. 3
'SEDOBROL' Bouillon Tablets	One to 1½ tablets daily. Epilepsy: Up to 2 or more daily	Suggested in simple Nervous Disorders: 1st week: 2 tablets daily; 2nd and 3rd: 1 tablet daily; 4th and 5th: 1 tablet alternate days. In Epilepsy: 2 to 6 tablets daily
'SEDORMID' Oral Tablets (a) Sedative doses (b) Hypnotic doses	*Infants:* One-quarter tablet one to three times daily *Older children:* Half a tablet	(a) Half to one tablet, two to three times a day. (b) One to two 20 minutes before bedtime
'SOMNIFAINE' Oral Solution Ampoules (a) Sedative doses (b) Hypnotic doses (c) In emergencies	Two to five drops (2 to 15 daily)	(a) Twenty to forty drops (= 10 to 20 min.) (b) Repeat the dose or give, initially, sixty drops (c) Sixty drops or one to three ampoules intravenously

May we send you a free sample of 'Allonal,' the all-round sedative and hypnotic with pronounced analgesic properties. Please complete and return the coupon, duly signed, and kindly add medical qualifications, as the preparation is a "scheduled poison."

ROCHE PRODUCTS LIMITED,
WELWYN GARDEN CITY, HERTS.

Please send for use in my practice a sample packet of 'Allonal' Tablets (6)

Personal Signature .....

Name & Address .....
(BLOCK LETTERS PLEASE)

Date .....

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ROCHE PRODUCTS LIMITED, WELWYN GARDEN CITY, HERTS

inhibit bacterial growth in upper respiratory tract infections

TONSILS and adenoids, when diseased, provide a fertile field for the proliferation of pathogenic bacteria. The growth of these organisms, which may frequently cause severe complications, may be inhibited or prevented by the application of Solution S.T.37.

Because of its high germicidal activity and low tissue toxicity, Solution S.T.37 is of particular value in the prevention and treatment of these conditions. The germicidal activity of Solution S.T.37 is retained in the presence of secretions and hence is of especial value in the treatment of acute naso-pharyngitis, pharyngitis, tonsillitis and laryngitis.

Although highly bactericidal, Solution S.T.37 does not destroy the natural defence mechanism of the tissues. In addition, Solution S.T.37 exerts a surface analgesic effect which promptly relieves the pain of inflamed mucous membranes.

Thus, the therapeutic action of Solution S.T.37 is three-fold:

SOLUTION S.T.37

- **It exerts a marked bactericidal action.**
- **The normal physiological activities of the tissues are not affected.**
- **A mild surface analgesic action is produced.**

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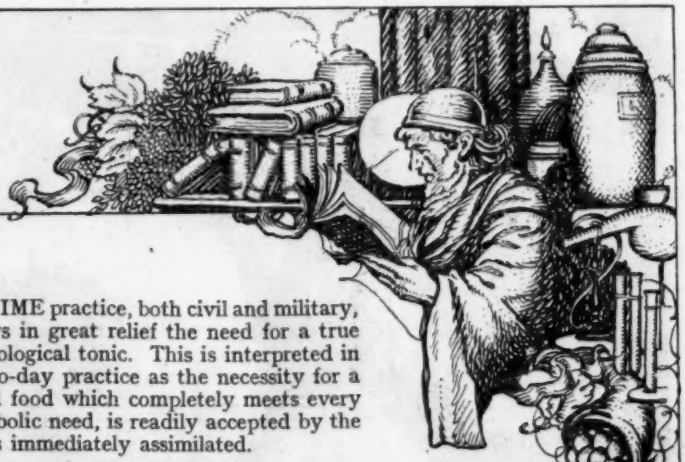
14



WAR-TIME practice, both civil and military, throws in great relief the need for a true physiological tonic. This is interpreted in day-to-day practice as the necessity for a liquid food which completely meets every metabolic need, is readily accepted by the patient and is immediately assimilated.

'Ovaltine' meets this necessity in a highly satisfactory manner both as an emergency measure and as a regular routine. The nutritive and energising constituents of 'Ovaltine' are rapidly assimilated, providing every dietary essential and, at the same time, allaying nervous tension in a most helpful manner.

Now, as in 1914–1918, 'Ovaltine' is widely used in the war-time hospital service both in England and overseas. It is without a rival as a routine dietary supplement designed to meet abnormal demands on the nervous system, while its use at night produces a definite and very desirable sedation.

'Ovaltine' possesses many advantages over ordinary food drinks. It is a concentrate derived from malted barley, full-cream milk and eggs from the world-famous 'Ovaltine' farms, and contains vitamins A, B complex and D, and important mineral elements. Its content of "first-class" protein, carbohydrate and fat is carefully adjusted to the optimal ratio for metabolic needs. Moreover, 'Ovaltine' possesses special properties which make milk more digestible, and thus easily assimilated by even the most acutely ill patient.

Supplies are available to hospitals in special packings and at special prices.

A liberal supply for clinical trial sent free on request

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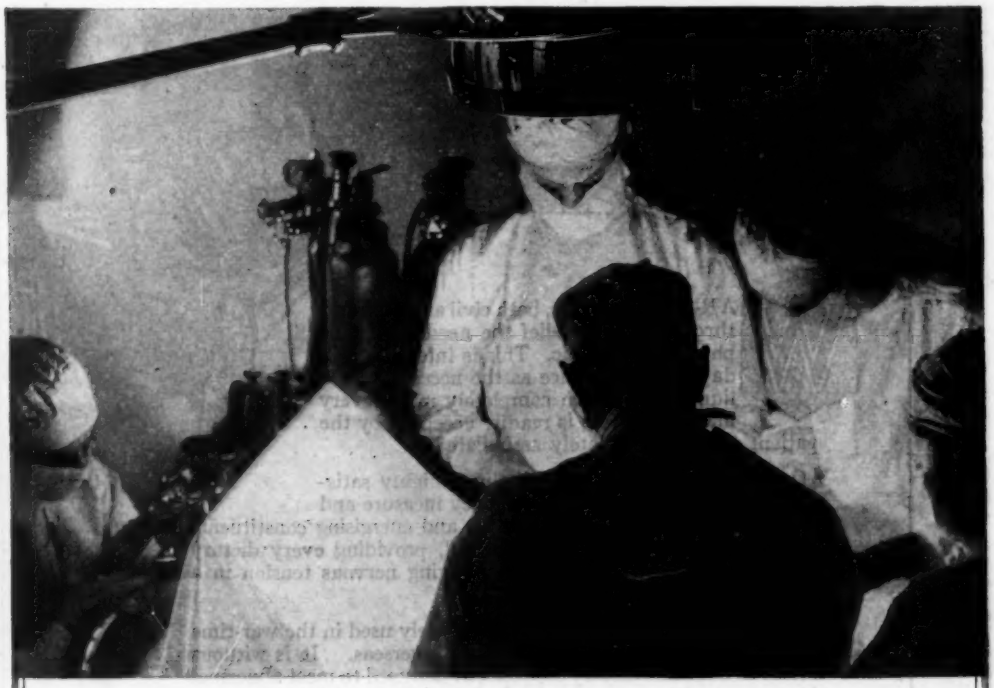

TRADE MARK **'MERTHIOLATE'** BRAND

SODIUM ETHYL MERCURI THIOSALICYLATE

'MERTHIOLATE' brand sodium ethyl mercuri thiosalicylate engenders a feeling of security and meticulous discharge of responsibility in the discriminating surgeon as he closes the abdomen or prepares to dress the operative wound in those cases where this antiseptic has been employed.

TINCTURE 'MERTHIOLATE' is an alcohol-acetone-aqueous solution, 1:1,000. Recommended as an effective antiseptic on the intact skin.

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Both Tincture 'Merthiolate,' 1:1,000, and Solution 'Merthiolate,' 1:1,000, are available in four-ounce, sixteen-ounce, and one-hundred-twenty-eight-ounce bottles.

ELI LILLY AND COMPANY LIMITED
BASINGSTOKE and LONDON

DIPHTHERIA & WHOOPING COUGH PROPHYLAXIS

with D.W.P. (*Evans*)

Immunisation against diphtheria and whooping cough can now be carried out by the simultaneous administration of a single mixture of diphtheria toxoid and whooping cough vaccine.

Diphtheria Prophylactic Toxoid (*Alum Precipitated*) and Whooping Cough Vaccine—D.W.P. (Evans).

The following figures extracted from the Infectious Diseases and Vital Statistics indicate the desirability of immunisation.

Cases notified in the British Isles	*Diphtheria*	*Whooping Cough*
8 weeks ended, June 14, 1941	9,536	38,396
Corresponding period, 1940	8,295	5,508

Technical literature sent on application to Home Medical Dept., Royal Liver Building, Liverpool.

DOSAGE:

First Dose: 0.5 c.c. (0.25 c.c. A.P.T. + 15,000 millions H. pertussis).

Second Dose: 1.0 c.c. (0.5 c.c. A.P.T. + 30,000 millions H. pertussis).

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PRICES AND PACKAGES:

Boxes of 3 graduated doses (sufficient for one case) 6/- per box

Rubber-capped bottles of 10 c.c. 15/- each

Prices apply to Gt. Britain and N. Ireland only and are subject to the usual discounts.

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After The First Step
by S. F. Pelee

Vitamins A, B_1, B_2 *and* D
Calcium and Phosphorus
Liver and Malt Extracts

IN ONE PALATABLE PRODUCT

ABBOTT'S HALIVER MALT with Viosterol is biologically standardised for vitamins A, B_1, B_2 and D. Each teaspoonful is equivalent in vitamin A potency to at least one teaspoonful of high grade cod-liver oil; in vitamin D potency to five drops of Viosterol in Oil. In vitamins B_1 and B_2, three teaspoonsful are equivalent to at least one cake of moist, compressed yeast. The liver extract in this preparation is a standardised extract and contains the necessary factors for the production of mature red blood corpuscles. The pure barley malt extract supplies diastase and a number of valuable nutritive substances. ● Each fluid ounce of Haliver Malt with Viosterol contains not less than: 27,000 International units of vitamin A; 50 International units of vitamin B_1; 50 Sherman units of vitamin B_2; 7,000 International units of vitamin D; the equivalent of 5 grs. of mono-calcium phosphate; and the equivalent of ½ oz. of fresh, mammalian liver. ● Because the vitamin A and D content of this product is supplied by Haliver Oil (halibut-liver oil, Abbott) and Viosterol, *Haliver Malt with Viosterol is entirely free from the disagreeable "fishy" taste to which so many patients object in malt preparations containing cod-liver oil.* ● Abbott's Haliver Malt with Viosterol is supplied through pharmacies in 8-ounce and 32-ounce bottles. Requests for professional literature are invited.

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Abbott's
HALIVER MALT
BRAND
with Viosterol

Please send literature on Abbott's Haliver Malt with Viosterol to

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LANCET-19

THE PROPHYLAXIS OF

INFECTIONS

IN GENERAL PRACTICE

The administration of **DAGENAN—M & B 693** is a rapid and effective method of removing meningococci from the nasal-pharyngeal mucosa. Fairbrother (*Brit. Med. J.*, 1940, 2, 859) made this interesting and important discovery and considers that when carriers have been identified by swabbing, treatment by chemotherapy "should prove of great value."

SOLUSEPTASINE Spray Solution. There is clinical evidence that three or four drops instilled into the nostrils at four-hourly intervals is of value in the treatment of common colds.

PLANACRINE Lozenges are admirably adapted for the disinfection of the mouth and throat and for the treatment of ulcerations in these regions. They are employed both prophylactically and curatively in simple sore throat, tonsillitis, naso-pharyngitis, gingivitis and stomatitis.

PLANACRINE Lozenges combat the infection and relieve the pain without an analgesic.

Supplies:

★**DAGENAN—M & B 693**★—Containers of 25 tablets at 4s. 0d. (exempt from purchase tax).

★**SOLUSEPTASINE Spray Solution**—Bottles of 2 ozs. 10% Solution at 3s. 6d. (exempt from purchase tax).

★**PLANACRINE Lozenges**—Tins of 40 Lozenges at 1s. 6d. (plus purchase tax).

Subject to the usual discount.

★Trade Mark.

Dosage:

DAGENAN—M & B 693—
4 grammes (8 tablets) on the first and second days, and three grammes (six tablets) on the third and fourth days.

SOLUSEPTASINE Spray Solution—
Employ at four-hourly intervals.

PLANACRINE Lozenges—
One is allowed to dissolve in the mouth as required, two lozenges may be taken per hour, the maximum being 20 in twenty-four hours.

PHARMACEUTICAL SPECIALITIES M&B (MAY & BAKER) LIMITED DAGENHAM

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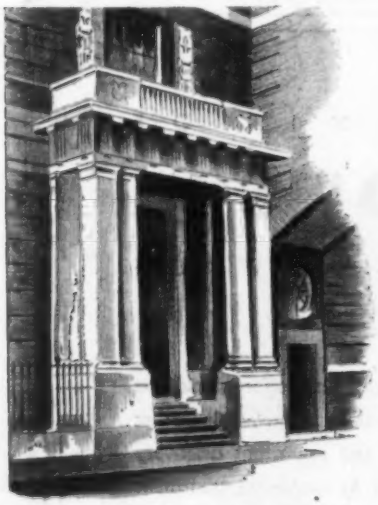

Entrance to Inoculation Dept., St. Mary's Hospital

St Mary's Hospital

VACCINES

THESE vaccines are prepared in the Laboratories of the Inoculation Department (Founder: Sir Almroth E. Wright, F.R.S., M.D., etc.) of St. Mary's Hospital, London, W.2, where constant observation of their effects on patients in the Research Wards and Out-Patient Clinics of the Department maintains their standard at a very high level.

Anti-Catarrh Vaccine

The ideal time for commencing prophylaxis against "colds" is during September. Three graduated doses, with an interval of from 7 to 10 days between each, are recommended. The vaccine especially designed for the purpose is "Anti-Catarrh Vaccine," containing *M. catarrhalis*, with *Pneumococcus*, *B. pneumoniae*, *B. septus*, *H. influenzae* and *Streptococcus*. Similar vaccines for the treatment of respiratory affections are also available.

Supplied in sets of 3 or 6 graduated doses and in ampoules of 1 c.c.; also in bottles of 10 c.c. and 25 c.c.

Influenza Virus Vaccine

Prepared from viruses isolated from cases of epidemic influenza in man. Protection from influenza by virus and bacterial vaccines should be commenced preferably in September or October to allow for the final dose in December or January. Five doses—two of virus vaccine and three of bacterial vaccine—may be expected to immunize for about a year.

Supplied in sets of five doses for immunization of one person, or in 1 c.c. ampoules of either virus or bacterial vaccine.

"T.A.B.T."

Particularly appropriate for war-time is this vaccine, which combines T.A.B. Vaccine with Tetanus Toxoid, allowing protection against the enteric group and tetanus in two doses instead of the usual four.

Supplied in sets of two 1 c.c. graduated doses or in vials of 25 c.c. of either first-dose strength or second-dose strength.

"W.A.P.T."

This is whooping-cough vaccine and diphtheria prophylactic combined. It allows simultaneous immunization against both diphtheria and whooping-cough in four doses only.

Supplied in sets of four 1 c.c. doses.

Preparing Vaccines

SOLE AGENTS

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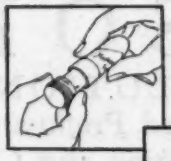
50, Beak Street, London, W.1

'METHEDRINE' BRAND INHALER

'Methedrine,' the N-methyl derivative of isomyn (Amphetamine), is chemically allied to adrenaline and ephedrine and has a rapid local vaso-constrictor action. Congestion of the upper respiratory mucosa is rapidly relieved by the vapour. It is indicated in acute coryza, acute sinusitis, rhinitis, etc.

The 'Methedrine' Inhaler is a practical and convenient device, easily carried in the pocket or handbag. At any time it can be brought into unobtrusive and effective use. Its construction makes it possible for all parts to be cleaned, a necessary precaution against re-infection.



How to use the 'METHEDRINE' INHALER

Cover is removed and the inhaler applied to each nostril in turn, opposite nostril is closed while inhaling.

Inhaler is easily recharged by replacing contents with a 'Methedrine' Refill.

'METHEDRINE' INHALER 1/9 each *(Purchase Tax 2¼d extra)*
REFILL 1/3 each *(Purchase Tax 2d extra)*
Subject to Medical Discount

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All patents and processes of the former company of Schering Ltd. have been acquired by British Schering Ltd. which is wholly British controlled, with British capital, and British staffed. A highly qualified team of research workers is carrying on the high traditions of the former company and gives promises of important advances in chemo-therapy.

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ORIGINAL ARTICLES

PREPARATION OF ALUM-PRECIPITATED TOXOID FOR USE AS AN IMMUNISING AGENT

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IT has been known since the work of Roux and Yersin (1889) that bacterial toxins are precipitated by the addition of potash alum. In 1926 Glenny, Pope, Waddington and Wallace showed that toxoids were also precipitated by alum and that a suspension of the precipitate had much higher antigenic efficiency for the same combining power. This was demonstrated with guineapigs, rabbits and horses (Glenny and Waddington 1928, Glenny 1930). In 1931 Glenny and Barr investigated the precipitation of diphtheria toxoid by potash alum and emphasised the necessity for removing, as far as possible, non-specific materials from alum-precipitated toxoid intended for human use. Further developments of this work have since been published. For example, the production of toxoid suitable for conversion into alum-precipitated toxoid has been reported by Pope and Linggood (1939). These workers devised a medium of low nitrogen content, which overcame many of the disadvantages of earlier types of medium, and on which it is possible to secure consistently filtrates having an Lf value of about 50 units per c.cm. (The higher Lf values have been obtained by careful control of the iron content of the medium.) These culture filtrates, after conversion into toxoid by formalin, can be purified considerably by suitable treatment with charcoal. Other procedures for increasing the purity of the final product have also been introduced.

In view of the great importance which these alum-precipitated toxoids have attained as immunising agents, and of the disturbing comments which have lately appeared (Bousfield 1941), we feel that a detailed account of the methods of preparation used in these laboratories would be of value.

PREPARATION OF TOXIN AND TOXOID

The toxin is prepared essentially as described by Pope and Linggood (1939) but the iron content of the medium is adjusted by adding 0·025 mg. of iron as ferrous sulphate dissolved in sodium citrate to each litre (1·24 g. $FeSO_4.7H_2O$ and 12 g. sodium citrate is dissolved in 500 c.cm. and 1 c.cm. of this solution is added to 20 litres of medium.) Culture filtrates containing from 40 to 60 Lf units per c.cm. are bulked together, and the amino-nitrogen content (Pope and Stevens 1939) determined. From this value, the amount of formalin (40% formaldehyde) to be added is determined according to the following figures.

Amino N (mg./10 c.cm.)	Adjust pH of toxin with acetic acid to	Formalin %
5– 6	7·4	0·4
6– 8	7·5	0·5
8–10	7·6	0·6

The pH of the culture filtrates is adjusted to the value shown before adding formalin; this is necessary to keep the material at a pH between 7 and 8 during toxoiding and so prevent the production of slow flocculating toxoid. Toxoiding is carried out at 37–38° C. for 3–4 weeks until the material passes the test described below.

In view of the fact that no antitoxin is introduced into this preparation, it is essential that the toxoid should contain no residual toxicity whatsoever. It is our custom, therefore, when the material appears completely toxoided, as judged by the intracutaneous injection of undilute toxoid into guineapigs, to repeat this test for non-toxicity using the skin of rabbits, which are even more susceptible than guineapigs to diphtheria toxin. This final test is performed on every bottle of every batch intended for use in the preparation of A.P.T. The completely toxoided material is then blended and purified by means of charcoal treatment.

Much work has been done in these laboratories with the object of finding the most suitable brand of charcoal for this purpose. The object of the charcoal treatment is to remove as much colour and non-specific nitrogenous material as possible, with minimal loss of specific toxoid. Some brands of charcoal are quite useless, and one with a selective action is necessary. The results of treatment of a single batch with three different brands of charcoal is shown in table I.

TABLE I—EFFECT OF VARYING QUANTITIES OF THREE BRANDS OF CHARCOAL ON THE SAME BATCH OF TOXOID

Grammes of charcoal per 100 c.cm. of toxoid	Charcoal 1		Charcoal 2		Charcoal 3	
	Yield of specific toxoid	Increase in purity	Yield of specific toxoid	Increase in purity	Yield of specific toxoid	Increase in purity
	%		%		%	
1	..	..	91·3	1·42	..	..
1·5	..	..	84·8	1·53	..	..
2	100	1·36	76·1	1·62	89·1	1·34
3	93·5	1·46	48	1·26	84·8	1·53
4	92·4	1·54	..	..	82·6	1·9
5	80·4	1·5	..	..	76·1	2·21

The only brand of charcoal which will give a two-fold purification is charcoal 3, 4% of which yields a product containing 82·6% of the original flocculating units, and 1·9 times as pure: 5% increases the purity, with a drop in yield to 76%. Neither charcoal 1, which is weak in activity, nor charcoal 2, which is overactive and not sufficiently selective, give satisfactory results when compared with charcoal 3, though both will increase the purity of the toxoid to 1·5 times that of the untreated toxoid. The amount of a suitable charcoal necessary to purify toxoids in this way varies from one batch of toxoid to another. It is therefore necessary to determine the optimum amount to use for each batch of toxoid intended for the preparation of A.P.T. This is done in the experimental laboratory by making mixtures of toxoid with known amounts of charcoal, allowing to stand for a definite period of time, filtering, and comparing the flocculating value and total nitrogen content of the filtrates with those of the untreated toxoid. The amount chosen for use in the bulk preparation is one which shows a good increase in purity (Lf doses/mg. N) with a reasonable yield of specific toxoid.*

A sample of the charcoal-treated bulk toxoid is then investigated in the experimental laboratory to determine the optimal amount of potash alum to add. Six different mixtures are made, containing a fixed volume of toxoid and varying quantities of alum (added in the form of a 10% solution). The mixtures are left to stand overnight; the supernatant liquids are then withdrawn and the precipitates washed with saline. The saline washing is repeated twice, and is followed by a washing with a solution containing 0·5% disodium phosphate (see Linggood 1939). This washing dissolves out some of the precipitate, and the effect varies according to the quantity of alum added originally to the toxoid. With some precipitates the loss of specific toxoid is considerable, but with others it is negligible, although much non-specific nitrogenous material may be dissolved out. This can be seen in table II. After the phosphate washings, the precipitates are given a further washing with saline, and finally suspended in saline to the original volume. Each precipitate is then tested for toxoid content by flocculation, and estimations of total nitrogen are made. In order to test the alum precipitates by flocculation it is necessary to dissolve them; it is our practice to add a small quantity of sodium citrate crystals to a portion of the suspension and place the mixture in a bath at 45–50° C.

The optimal amount of alum to be added to the main bulk of toxoid is decided from considerations of the yield of flocculating units and the purity (Lf/mg. N) of the precipitates.

* We have found that "Eponit C" charcoal is the most suitable for purifying toxoids, but owing to the war it is no longer obtainable. We are now experimenting with various British charcoals, and find that these tend to be somewhat overactive, but can be used with success in smaller quantities.

This varies not only with the type of medium on which the toxoids are made but from one batch to another made by exactly the same method. As in the case of charcoal treatment our aim is to obtain good purification with minimal loss of specific toxoid.

TABLE II—EFFECT OF A 0·5% AQUEOUS SOLUTION OF DISODIUM PHOSPHATE ($Na_2HPO_4,12H_2O$) ON WASHED ALUM-TOXOID PRECIPITATES

Alum added for precipitation (%)	Control (no disodium phosphate)		Precipitates treated with disodium phosphate	
	Flocculating units in precipitate (%)	Lf doses per mg. of N	Flocculating units in precipitate (%)	Lf doses per mg. of N
1	94	198	54	295
1·5	97	144	88	265
2	89	125	89	248
3	86	137	86	201
4	83	170	83	270

The bulk toxoid is precipitated aseptically with the amount of alum decided on from these experimental tests, and the same procedure of saline, phosphate, and final saline washings is followed. The supernatant liquid is then drawn off and the volume of the suspension made up to about half that of the original toxoid; a sample is then taken. This sample is dissolved by means of sodium citrate and tested by flocculation; by calculation from the value so obtained sufficient Merthiolate saline is added to make the A.P.T. contain 50–55 Lf doses per c.cm., and a final concentration of 0·01% merthiolate. It therefore follows that all our batches are of approximately equal strength as measured by combining-power tests, and as we shall show later there is but little variation in antigenic efficiency as indicated by the antitoxic value of the sera of guineapigs injected with many different preparations.

TESTS FOR ANTIGENIC EFFICIENCY

The antigenic efficiency of every batch of A.P.T. is tested in guineapigs, which are injected with two doses either of 0·01 c.cm. or 0·05 c.cm. separated by an interval of four weeks. Schick tests are done ten or eleven days after the second injection to comply with the regulations under the Therapeutic Substances Act. The animals are bled two days later when the tests are read. This interval after the injection of the Schick dose of toxin is too short for any immunity response to develop from this injection. Determinations of antitoxic value are made on the serum from each guineapig by intradermic titrations in guineapigs or rabbits. When sufficient animals are available the serum of each guineapig is tested at approximately 100% differences. The final result of each batch of prophylactic is recorded as the geometric mean of the antitoxic values of each guineapig.

Use of the geometric mean tends to lay too much stress on the occasional poor responder but is definitely to be preferred to the arithmetical mean or the value of pooled sera. During a period of acute shortage of laboratory animals, preliminary tests were made on individual guineapig sera at wide limits, and separate pools were made of those between 0·1 and 1, between 1 and 10, and those over 10 units per c.cm. The geometric mean of the antitoxic values of the separate pools is taken as the measure of antigenic response. We have recorded below only those sera which have been tested individually because the two methods are not strictly comparable. When individual tests are done the values recorded are underestimates—e.g., a value of 5 is recorded if a serum is known to be over 5 and under 10 units per c.cm. The method of pooling gives higher figures because the individual value of each pool represents the arithmetic mean of its constituents.

Recently we have tested 70 batches of A.P.T., representing a total of several thousand litres of finished product. Of 18 batches tested by means of two injections of 0·01 c.cm. one failed completely. Other tests on the same batch were successful and it is almost certain that some technical error occurred in this test. A total of 214 guineapigs were used for testing the other 17 batches. Of these, 212 were Schick-negative; of the 2 positive reactors 1 was found to contain under 0·01 unit of antitoxin per c.cm. and the other over 1 unit, indicating that the Schick test was incorrectly read. In our experience a non-specific reaction read as positive is very rare, occurring only once in several thousand tests. The geometric means of individual values varied from 1·2 to 3·3 with an average of 2·2 units per c.cm.

A total of 814 guineapigs were used to test 69 batches by means of two injections of 0·05 c.cm.; all were Schick negative. The geometric means of 44 batches individually tested varied from 1·35 to 6·8, averaging 3·9 units per c.cm. Tests were made at all times of the year using guineapigs from many sources. Of all the batches tested only one failed to produce a mean value of at least 2 units per c.cm. after two injections of 0·05 c.cm. or less. The one failure occurred when rabbits were used for testing the guineapig sera. Tests on individual sera show very little scatter (table III).

The majority of guineapigs with 0·005 unit or more of antitoxin per c.cm. are Schick negative. Over 85% of guineapigs injected with two doses of 0·05 c.cm. contained at least 400 times this amount of antitoxin. No quantitative measurement can therefore be made by means of the Schick tests until further work has been done on the effect of much lower doses of A.P.T. The scarcity of experimental animals has prevented our working out the smallest amount of A.P.T. that can be given by the two-dose method which will just produce a Schick-negative state in guineapigs, or the dose which will produce this effect when given singly. A few tests were made on the response to single injections of 0·05 c.cm.

TABLE III—TESTS ON INDIVIDUAL SERA

Antitoxic units per c.cm.	Number of guinea-pigs injected with two doses of:		Antitoxic units per c.cm.	Number of guinea-pigs injected with two doses of:	
	0·01 c.cm.	0·05 c.cm.		0·01 c.cm.	0·05 c.cm.
Under 0·01	1	0	1·0	27	33
0·1	2	5	2·0	85	205
0·2	3	2	5·0	43	169
0·5	12	19	10·0	18	61
			25·0	1	1

and all 23 guineapigs injected produced over 0·1 unit in four to six weeks. It is possible, however, that A.P.T. administered in very small doses involving dilution may be absorbed so rapidly that a true measure of the antigenic efficiency of undilute A.P.T. cannot be gauged by tests made using very small dosage. The estimation of the amount of antitoxin produced in guineapigs by a reasonable dosage appears the most satisfactory way of assessing any particular product.

An easier method that must be further explored consists of testing the immunity produced in guineapigs by a form of multiple Schick testing. The test dose to be used is so large that it need no longer be measured in terms of Schick doses but in terms of the Lf dose of a toxin. We have tested three batches of A.P.T. on 44 guineapigs by this method. The guineapigs received two injections of 0·05 c.cm. of A.P.T. at four weeks' interval; twelve days after the last injection they were given 0·1 Lf (100 times Schick dose) and 1 Lf of toxin intracutaneously. The smaller dose caused no reaction in any guineapig and 35 (80%) did not react to 1 Lf of toxin. We hope shortly to link up the antitoxin produced in guineapigs with their tolerance to toxin in terms of Lf doses and to adopt this method as a routine.

DISCUSSION

Our work has been done in the laboratories where the use of alum to enhance the efficiency of antigens was discovered, where alum toxoid was first used in the immunisation of horses, first prepared and recommended for human immunisation, and first given, for brevity, the name A.P.T. We and former colleagues here have been concerned constantly to improve the product, by aiming at standards of purity and efficiency which have steadily risen with experience. The preparation has acquired a wide reputation in the immunisation of children, particularly because of its effectiveness in two doses, in contrast to the usual course of three doses needed with the weaker preparations, T.A.F., F.T. and T.A.M. But if a preparation is to be described as A.P.T., with the implication that it will thus safely immunise in two

small doses, it must be prepared and tested by methods which will give it this efficiency; and it seems to us likely that methods which have recently been described by other workers will be found to fall short of this requirement at more than one point.

We hope that the procedure we have here described, representing the stage now reached by some ten years of experience, will be further and progressively improved by workers in other laboratories, as well as by ourselves. With a view to assisting such progress, it may be useful to set out the following points in our present practice to which we attach importance.

1. The aim is to obtain, in the final product, an adequate concentration of flocculation equivalents (we require 50 Lf per c.cm.) without overloading it with unspecific materials. To achieve this we have found it desirable to start with a toxoid having itself about 50 Lf per c.cm. There may well be methods by which the same specific potency and purity can be attained in an A.P.T. made from a much weaker toxoid; but we have not yet discovered them.

2. Addition of alum is not adjusted to the point of producing the maximum yield of precipitate. The amount added is that found, by trial, to give a precipitate of high activity, low content of non-specific impurities and a reasonably good yield of the original toxoid.

3. We use alum alone for the precipitation. A complex containing toxoid can be obtained by adding aluminium hydroxide to formol toxoid, and another by adding alum and acid; but neither of these can be regarded as identical with that produced by alum alone. It has been found by some of our colleagues that the precipitate with alum and acid, in particular, contains a more soluble "acid precipitate," in addition to the less soluble "alum precipitate," and it is not safe to assume that these are equal in immunising potency. It was to the alum precipitate alone that the name "A.P.T." was first applied. We plead for its restriction to this original sense. Some variation in the immunising potency of preparations giving similar flocculation values may still be inevitable; but it is the more important not to admit any which can be excluded.

4. It has long been known that the use of phenol as a preservative, in the final suspension, damages the antigen, so that its immunising potency falls rapidly. We avoid using phenol at any stage of the preparation, as well as in the final product.

5. The official "test for potency as an immunising antigen," in the regulations under the Therapeutic Substances Act, was formulated in 1931, before A.P.T. came into use, and must obviously have been framed with reference to the types of diphtheria prophylactic then generally available, of which *three* injections are required for immunising a human subject. In the absence of any official test specially applicable to A.P.T., this stronger preparation has only to pass the minimum tests thus prescribed for the earlier and weaker ones. It is easy to show that relatively very weak preparations of A.P.T. will pass this guineapig test with ease. A.P.T. is a more potent immunising agent, not only of man but of the guineapig, and there is no ground for the assumption that the ratio of its superiority is the same in the two cases. Our own evidence suggests that precipitating a toxoid with alum increases its immunising effect, on the guineapig, as much as a hundredfold. We have accordingly demanded of our final product, made up to contain 50 Lf per c.cm., that, with the two small doses we have indicated, it shall raise the immunity of guineapigs to the level at which they give a negative response, not merely to 1 Schick test dose, but to at least 100 such doses.

The advance of knowledge of the properties of A.P.T. has been so rapid and so recent, and its publication has hitherto been so incomplete and scattered, that official regulations for its control could not be expected to keep pace with the development of its production. We hope that the details here recorded will facilitate an early definition of requirements and tests for A.P.T. as such. We are familiar with the difficulty of measuring immunising potency with any approach to accuracy; but it is clearly important that official tests shall not be open to wide differences of interpretation. It ought to be possible, at least, to ensure and to impose a common aim and understanding with regard to the measurement and notation of the strength of A.P.T. and the consequent adjustment of its dosage.

SUMMARY

A.P.T. produced at these laboratories contains 50 Lf doses of toxoid per c.cm.

Guineapigs receiving two injections of 0·05 c.cm. (or less) at four weeks' interval produce 2 units of antitoxin per c.cm. of serum within ten days of the second injection.

Such guineapigs can be tested by the intracutaneous injection of from 0·1 to 1 Lf dose of toxin. The exact level of immunity to be used as a criterion of potency has not yet been fixed.

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LIVER EXTRACT IN TREATMENT OF TROPICAL MACROCYTIC ANÆMIA

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THE treatment of nutritional tropical anæmia is not nearly as satisfactory as that of the allied condition, pernicious anæmia. Wills (1933) discovered the value of Marmite, and the textbooks still insist on it; but few patients can tolerate the necessary ½–2 oz. a day; and the treatment is expensive. Wills has now discarded marmite in favour of liver extracts.

In pernicious anæmia ½ lb. of whole liver daily is usually curative, but in tropical macrocytic anæmia about four times this amount is required, which is too much for any patient to consume. Better success has attended the use of crude liver extracts administered by injection.

Campolon has been more extensively used than any other product; 1 c.cm. of the extract is derived from 5 g. of raw liver. It has given uniformly good results in the hands of more than a dozen different investigators, and cases in which it has proved ineffective have been rare. Dosage varies, but most workers find that 5–10 c.cm. daily is needed; the same dose given once a week is as a rule successful in pernicious anæmia. Foy and Kondi (1939) give up to 12 c.cm. in the hæmolytic variety of macrocytic anæmia; in the non-hæmolytic variety, which seems to be commoner in India than elsewhere, many workers report that campolon is effective when given in doses of only 2 c.cm. daily. This represents experience up to the outbreak of war, when it became increasingly difficult to get campolon. I am aware of no reports on Hepatex. Some reports, favourable on the whole, have been made on the more potent Neo-hepatex; Wills (1938) used it successfully on 4 cases of non-hæmolytic macrocytic anæmia; Anderson and Roberts (1940) gave 2 c.cm. daily for three days, and then 2 c.cm. weekly to 4 adult cases, 2 of which appear to fall into the hæmolytic variety of Fairley (1938) and 2 into the non-hæmolytic variety of Wills. In 9 cases of my own, neo-hepatex was successful in 6 and failed in 3, owing either to intercurrent disease (chronic nephritis or tuberculosis) or to insufficient dosage. When less than 2 c.cm. was given daily the response was poor, and in some cases 4 c.cm. was needed. My experience confirms that of others that larger doses are required for the hæmolytic variety of the disease (Trowell 1940). As far as I know, nobody has reported total failure with neo-hepatex. Hepatex-T contains liver, vitamin B_1, riboflavine, nicotinic acid and vitamin B_6. I have seen no reports on its effects, and it seems to me unsatisfactory to administer a mixture of liver and the vitamin-B complex.

Earlier work on marmite led to the hope that the vitamin-B complex would yield either Castle's extrinsic factor or else some hæmopoietic factor needed in the

pernicious-anæmia group. Attempts to isolate these factors have failed, and the administration of fractions of the vitamin-B complex in tropical macrocytic anæmia rests on no certain scientific basis.

Anahæmin, an extremely concentrated liver fraction, though effective in the treatment of pernicious anæmia has been found to have only a limited action in tropical microcytic anæmia. Wills (1938) has never found that non-hæmolytic cases in pregnant women respond. Napier and his colleagues (1938) found anahæmin curative in 3 out of 6 cases of macrocytic anæmia. I have made fair trial of anahæmin in only 3 cases of the hæmolytic variety of the disease, giving from 8 to 14 c.cm. in single doses and assessing the reticulocyte response and the change in the blood-count; the cases showed little or no response. Recently Foy and Kondi (1939) found that anahæmin in very large doses produced a satisfactory response in these cases, and Fairley (1940) has reported 1 non-hæmolytic case in which 64 c.cm. of anahæmin was given before the blood-count became normal. An ordinary case of pernicious anæmia recovers in a few weeks on 1–2 c.cm. of anahæmin a month, which gives some measure of the size of the dose required in tropical macrocytic anæmia. Treatment is thus expensive if anahæmin is used, and Fairley recommends cruder preparations. It seems that some fractions essential to the cure of tropical macrocytic anæmia are lost in the refining process. I have received some of these fractions from British Drug Houses and it may be possible to test them later on proved cases, but it seemed wise to issue this preliminary note because the only preparation which will be on the market for some time to come will be their liver extract for injection.

To test a new preparation it is necessary to find uncomplicated and proved cases of the disease. Out of 12 cases of tropical macrocytic anæmia treated in my wards during 1940, 2 were chosen because they showed little or no evidence of intercurrent disease; many of our cases are complicated by malaria, hookworm disease, yaws, syphilis, tuberculosis or nephritis.

CASE-REPORTS

CASE 1.—A man aged 25, admitted on May 27, 1940, had had malaise for an indefinite time and abdominal swelling for 2 weeks. Nutrition fair, temperature normal, pallor, no œdema, slight jaundice. Border of spleen palpable at umbilicus; firm but not tender. Liver not palpable. No other physical signs. A blood film showed no parasites. Kahn test negative. Stools: no ova seen; tænia segments passed occasionally; occult-blood test negative. Test-meal, normal free hydrochloric acid. Urine: a trace of albumin. Van den Bergh reaction indirect positive 2·4 mg. Blood-count on May 29 showed: red cells, 1,500,000; 3 megaloblasts of Ehrlich to every 100 white cells; reticulocytes 8·5%; Hb (Sahli) 34%; colour index (corrected) 1·35; mean cell diameter, 7·6 μ; mean cell volume, 133·3 cu. μ; white cells, 6200 (polymorphs 43%, lymphocytes 45%, eosinophils 12%). Examination of bone-marrow on June 1 showed: white cells 62%, red cells 38% (late erythroblasts 7%, basophilic normoblasts 9%, polychromasic normoblasts 11%, orthochromic normoblasts 7%, megaloblasts of Ehrlich 4%); smear rather acellular. Splenic smear on the same day showed reticulo-endothelial cells 78%, neutrophils 9%, lymphocytes 9%, eosinophils 1%, late erythroblasts 1%, megaloblasts of Ehrlich 2%; hæmosiderin pigment was present.

June 3, injection of liver extract (B.D.H.) 5 c.cm. given. June 6, reticulocyte crisis to 13·2%. June 10, 5 c.cm. of extract injected; June 20, 18 c.cm. Steady rise of weekly red-cell count, at first slowly then more rapidly to 4,120,000, with Hb 60%, on July 4. Spleen decreased slightly in size and was four finger-breadths below the costal margin on July 8 when he was discharged.

CASE 2.—A woman aged 30, admitted on May 11, 1940, had felt well until she developed bronchitis about a week before admission. Nutrition good; pallor, moderate jaundice; border of spleen at umbilicus, very tender. Temperature 100° F., pulse-rate 140. Mild bronchitis and basal congestion. No other physical signs. Blood film, no parasites. Kahn test negative. Stools contained a few hookworm ova. Occult-blood test weakly positive. Urine normal. Van den Bergh, 2 mg., indirect positive. Test-meal, hydrochloric acid normal. Blood-count on May 15 showed: red cells 1,760,000; Hb 32%; C.I. 1·09. May 20, bronchitis settling; blood-count: red cells 1,800,000 (4 nucleated reds, including 1 megaloblast of Ehrlich, to every 100 white cells, reticulocytes 3·2%); Hb 35%; C.I. 1·16; M.C.V. 100 cu. μ; white cells 3800 (polymorphs 47%, lymphocytes 36%, monocytes 9%, eosinophils 8%). Sternal marrow: hæmocytoblasts 2%, early erythroblasts 11%, late erythroblasts 32%, basophil normoblasts 1%, no myelocytes, metamyelocytes 6%, stab cells 8%, neutrophils 3%; proportion of red cells to white cells, 6:1; marrow very cellular, showing active erythropoiesis of normal type, with no tendency towards the megaloblastic change of pernicious anæmia. Three subtertian schizonts seen in 100 fields, indicating chronic malaria in the latent stage; no parasites found in circulating blood, though doubtless a few would appear from time to time. The blood picture showed no change after quinine, gr. 30, had been taken for a week, and I believe malaria played no part in the anæmia.

On May 23, neo-hepatex injections were begun, 4 c.cm. being given daily until May 30. On May 28 there was a reticulocyte crisis of 12%, and the hæmoglobin rose rapidly to 46%. On May 30 the red cells had risen to 2,840,000. Soon after the injections were stopped the blood picture became stationary and remained so from June 3 to 6, when the red cells were 3,400,000; Hb 50%. On June 7 liver extract (B.D.H.) 5 c.cm. was given and the hæmoglobin rose at once to 65% and the red cells to 4,420,000; no reticulocyte crisis was detected, but there was a slight rise of reticulocytes from 5·4% on June 1 to 7% on the 14th. The spleen was four finger-breadths below the costal margin when the patient was discharged on June 15.

SUMMARY

Two cases of tropical macrocytic anæmia, uncomplicated by serious intercurrent disease, showed satisfactory response to liver extract (B.D.H.) given in doses of 5–10 c.cm. weekly. The extract may prove to be more effective in the treatment of this type of anæmia, as well as cheaper, than the refined liver extracts which are potent in the treatment of pernicious anæmia.

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SIMPLE SYSTEM OF SPLINTING FOR LOWER LIMB

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IN the last quarter of 1939 our attention was focused on the provision of accommodation and equipment for the treatment of increased numbers of fractures, both simple and compound. For injuries of the lower limb it seemed certain that splints of the last war—the Thomas and Braun—and the more recent Böhler modification of the Braun splint would find almost universal favour. Further consideration of the Braun splint for the tibia, and Böhler-Braun modification for femur, showed that certain disadvantages which these splints possess become accentuated by the conditions of modern war. Being somewhat awkward and bulky they are difficult to store and not easily transportable. They require some form of fixation to the foot of the bed, and for ease of nursing and the patient's comfort require to be constructed for both right and left sides. An important disadvantage is the quantity of metal they contain.

About four years ago a simple wooden bed-rest was constructed for use in conjunction with the Thomas

splint, and is now used in many hospitals. It has been illustrated elsewhere[1] but not previously described. The simple method of splinting for the lower limb about to be described is based on this rest. It is proposed to describe its construction and mode of use in conjunction with a Thomas splint for simple fractures of the femur, and to explain the few additions which convert it into either a Braun or a Böhler-Braun splint.

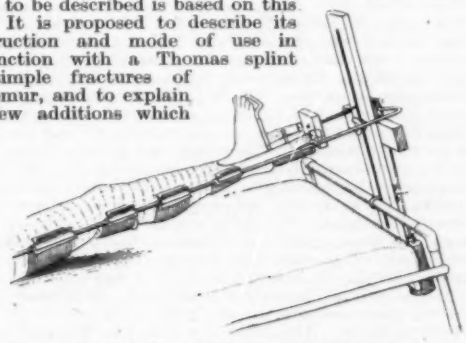

FIG. 1—Wooden rest used for supporting and fixing Thomas splint to foot of bed.

The Thomas splint rest consists of two strips of wood 3 ft. 9 in. × 3 in. × ¾ in. and 12 in. × 3 in. × ¾ in. In the larger a ½ in. slot is cut which runs almost from end to end, small sections of wood being retained intact at one extremity and in the centre to maintain the strength of the strip. On the smaller, which is drilled centrally to carry a ⅜ in. bolt, are mounted two pulleys to carry the extension cord. Two hooks, threaded ⅜ in. and fitted with wing nuts and washers of large surface area, pass through the slot and attach the upright portion to the bars at the foot of the bed, while the shorter horizontal portion is attached and adjusted for height by a straight ⅜ in. bolt and wing-nut (figs. 1 and 2).

Method of use with a Thomas splint.—It will be seen from fig. 1 that this rest has the advantage of maintaining permanent fixation of the distal extremity of a Thomas splint in the horizontal position at the desired height. This fixation allows the lower end of the bed to be raised, which causes the patient's body-weight to exert counter extension, thus increasing the distraction at the site of the fracture while preventing undesirable pressure by the ring of the splint on the ischial tuberosity. When the Thomas splint is too long in relation to the patient's height and the length of the bed, a point of fixation nearer the proximal end is obtained by inserting an adjustable "hand rest" between the horizontal metal rods of the splint. All additional apparatus should be avoided, but in certain cases where nursing is difficult it may be necessary to provide weight suspension of the ring of the splint from a Balkan beam. There is no known method of either "fixed" or "weight" extension which does not require constant care and attention if the optimum results are to be obtained. However, it is claimed for this simple splint rest that the necessity for constant adjustments is reduced to a minimum.

Conversion to Braun or Böhler-Braun type of splint.—It will be seen from figs. 2 and 3 that the Thomas splint rest is converted into a Braun type splint by the addition of two bent strips of ¾ in. × ¼ in. mild steel secured to the horizontal portion of the rest by bolts and wing-nuts and braced at their proximal ends by short strips of the same material hinged centrally to form an X and secured for ease of assembly by bolts and wing-nuts. The two strips which form the horizontal platform of the splint are of different lengths and shape. For the patient's comfort and ease of nursing the shorter side is placed nearest the perineum thus providing a splint for either the right or left side with the same basic material. The loop used for suspension of the foot or protection of the limb is of conventional pattern. The provision of the extra pulley which converts the Braun splint for tibia to the Böhler-Braun type for femur is accomplished by the attachment of a further wooden horizontal section to the vertical portion of the original splint rest (fig. 4).

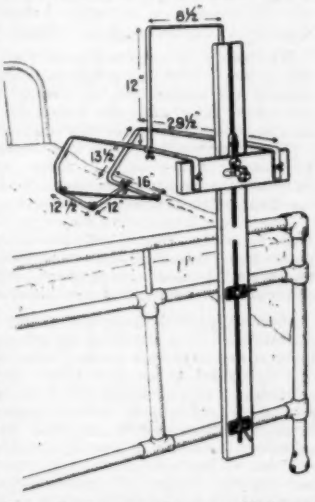

FIG. 2—Components assembled as Braun splint for left side; showing suspension or protection loop in position. Addition of a further wooden horizontal section provides the extra pulley which converts splint into Bohler-Braun type for femur.

SUMMARY

A simple system of splinting for the lower limb is described. This consists of a wooden rest for the Thomas splint, providing permanent fixation of the splint to the foot of the bed in the horizontal position at any desired height. The method of converting this Thomas splint rest to either a Braun or Böhler-Braun splint is shown. The system has technical advantages over the original types in addition to simplicity, portability and low cost.

The original models of this system of splinting were made for me by Archibald Young and Son, Ltd., 57–61, Forrest Road, Edinburgh, 1.

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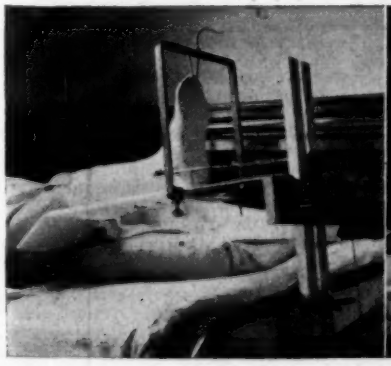

FIG. 3—System in use as Braun type splint for a spiral fracture of tibia.

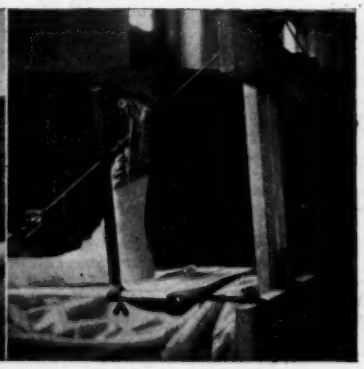

FIG. 4—System in use as Böhler-Braun type splint for fracture of shaft of femur.

PHENYTOIN SODIUM (B.D.H.).—An anticonvulsant for use in the control of epilepsy is available for oral administration in 1 g. tablets. It is sodium diphenylhydantoinate, a derivative of glycolyl urea and an analogue of the barbiturates. Its hypnotic effect is said to be negligible. On beginning treatment with Phenytoin Sodium patients who are taking bromides or phenobarbitone should not stop at once these drugs but should gradually reduce the dose. Mild toxic effects noted after the administration of phenytoin sodium include ataxia and vertigo, and treatment should be discontinued if a rash or pyrexia occurs. After a long course of treatment gingival hyperplasia has been reported (*J. Amer. med. Ass.* 1939, **112**, 1244) and vitamin C may be given concurrently to prevent this.

PULMONARY MONILIASIS
WITH PRIMARY BRONCHOGENIC PNEUMONIA

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BRONCHOMONILIASIS has been observed to occur alone and in association with tuberculosis of the lung and other chronic lung infections. An acute primary staphylococcal infection of the lung, though fairly common in infants and young children, is uncommon in adults. The association of both conditions in one patient seemed worth reporting. The moniliasis fungus is widely distributed in nature, usually as a saprophyte in dead leaves or decomposed wood, in man and animals it is often found in the skin and mucous membranes. Under appropriate conditions it may change from a saprophyte to a parasite and then produces cutaneous, bone, mucous membrane and pulmonary lesions. Bakst, Hazard, and Foley (1934), and Davis and Warren (1937), have reviewed the literature on monilia infections of the lung and classified the disease into 3 types :—

The mild type may not greatly affect the general health of the patient; there is cough with mucopurulent sputum, and usually no hæmoptysis or fever. The chest may contain scattered râles, and the condition may persist for several months or may progress to a more severe form.

The intermediate type may simulate bronchitis or early pulmonary tuberculosis; there are often fever, cough, mucopurulent sputum, occasionally blood-stained sputum, and localised or generalised fine or coarse râles.

The severe type gives a history and physical signs similar to those of well-advanced pulmonary tuberculosis; the patient shows general malaise, loss in weight, dyspnœa, fever, cough, and often blood-stained sputum, chest pains, râles and signs of pleural thickening and consolidation.

Fawcitt (1938) studied a group of cases of pulmonary moniliasis when working on pneumoconiosis. He found pulmonary mycoses among farm and dairy workers and distinguished these infections clinically from pneumoconiosis by the occupational history, radiological findings and mode of onset, which is acute or semi-acute in bronchomycoses, and gradual with a history of long exposure to silica in pneumoconiosis.

Primary bronchogenic staphylococcal pneumonia is a non-septic form of pneumonia. Reimann (1933) reported all blood-cultures as negative in a series of 6 cases. Kanof and others (1939) obtained negative blood-cultures in all of a series of 13. This type of pneumonia is fairly common in infants and children and is then often associated with serous pleural effusion and empyema. In infants the fatality is high; Macgregor (1936) states that of 10 cases not one survived. The adult form of the disease is characterised by rapid onset, extreme prostration, massive bronchogenic spread within the lungs, copious mucopurulent sputum, which is not foul-smelling, and a high fatality. In most cases the *Staphylococcus aureus* is the causative organism.

CASE-HISTORY

A lance corporal in the field security section aged 27 was admitted to a casualty clearing station on Nov. 25, 1940, as a case of persistent fever without obvious cause. On Nov. 15 he had had a cold, which made him feel out of sorts, and easily tired. This persisted and became worse. On Nov. 22 he was sent to the reception station where he was detained for 3 days before being admitted to hospital.

His temperature on admission and during the next days swung between 99·6° F. and 102° F.; pulse-rate 92, respiration 24. Physical examination was negative. By Nov. 26 his temperature had risen to 103° F.; he did not feel very ill and had no pain or discomfort in his chest. On the 27th, respiration 24, pulse-rate 115, temperature 103° F.; except for a slight headache he did not complain. Patchy areas of impaired resonance were found on both sides of the chest, the wider distribution being on the left; breath sounds over these areas were harsh and tubular; there were a few fine crepitations. Blood-culture was negative throughout the illness. Agglutination reactions against the typhoid, paratyphoid group and *Brucella abortus* were negative on several occasions. White-cell and differential counts were normal. The spleen was never palpable. On Nov. 28 areas of dullness were spreading towards the front of the chest; air entry was diminished over these areas, there were numerous moist sounds, expansion was poor, respiration 32, pulse-rate 128, temperature 104° F. The patient was cyanosed and had a hacking cough, the sputum was sticky, tenacious, streaked with blood and mucopurulent. Throat swabs taken on Nov. 27 and 28 gave no pathogens on culture. On Nov. 28 sulphapyridine, 2 g., was given by mouth, and 1 g. of the soluble salt intramuscularly; after 2 hours a further 2 g. was given by mouth and thereafter 1 g. every 4 hours, until 20 g. had been given. Oxygen was given continuously by the Cambridge technique. On Dec. 1 there was no improvement. The patient's condition suggested œdema of the lungs; air entry and expansion were poor, coarse, medium, and fine râles were present all over the chest back and front, sputum was copious, frothy, blood-stained, and mixed with strands of stringy pus. Pulse-rate 130; heart dilating. Dullness at both bases, and a patchy distribution of dullness throughout both lungs. As sulphapyridine seemed unsuccessful, treatment with sulphathiazole (M. & B. 760) was begun. The initial dose was 2 g., followed by 1 g. every hour. After 12 hours, when 14 g. had been administered, there was a slight fall in temperature, the pulse-rate was 100, respiratory movements were slower and less distressing, and the colour of the patient was better. On stopping administration for short periods the concentration in the blood fell, with resultant worsening in the condition of the patient; otherwise improvement was steady. After 36 hours of treatment (48 hours after sulphathiazole was begun) the patient seemed much better. He had then received 42 g. of sulphathiazole. The dose was now reduced, first to 1 g. 4-hourly, and then 3 times daily; it was finally stopped after 5 days when 60 g. had been taken. Cardiac stimulants were given during the illness as thought necessary, and rectal glucose and saline by the drip method. He made rapid progress and was sent home on the 27th day after admission.

Bacteriology was investigated by Dr. J. Duncan. On Dec. 5 the sputum contained thick, tenacious, blood-stained mucus, with adherent masses of white pseudomembrane, made up of squamous epithelium and a thrush fungus (*Mycotorula*). Staphylococci predominated in a direct smear, and culture gave a rich growth of *Staph. aureus*. On Dec. 12 the sputum still contained tenacious mucus with a few tiny flakes of pseudomembrane. Microscopically, mycotorulæ were scanty, staphylococci numerous; culture again gave *Staph. aureus*. Virulence test of culture (coagulase reaction) strongly positive.

DISCUSSION

The causative organism of bronchomoniliasis may be found in the sputum of normal people. A mild type of the disease may exist as a cause of pyrexia for some considerable time without producing many symptoms or signs. In this case the staphylococcal infection of the lungs was almost certainly the result of a primary infection of the respiratory tract, and not a hæmatogenous infection from a distant septic focus. There was no evidence and no history of any septic focus. The pathology of the lungs in fatal cases indicates that it is the result of an infection which reaches the lung via the bronchi. Primary staphylococcal pneumonia is usually of sudden onset. In the case reported here the early symptoms of cold, malaise and cough (which were present for almost 10 days before the patient became sufficiently ill for transfer to hospital) were probably due to monilia infection of the lung, and this made invasion by the staphylococcus easier; presumably large numbers of staphylococci reached the lungs via the respiratory tract, producing a massive infection. Sulphapyridine had no effect on the infection; the almost immediate improvement after sulphathiazole is noteworthy. The absence of any toxic signs or symptoms even after generous doses given rapidly (42 g. within 48 hours) illustrates the low toxicity of the drug.

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WASP-STING AS AN IMMEDIATE CAUSE OF DEATH

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THAT death should occasionally occur as the result of more or less remote complications of the single sting of a wasp or bee falls within the accepted view of things. It does not however appear to be generally recognised that such a sting may from time to time prove immediately fatal. Every year thousands of people in this country sustain wasp-stings without experiencing anything beyond transient and comparatively mild pain and inconvenience, but cases of more severe and even dangerous reactions are within the experience of many country practitioners. Immediately fatal cases are rare; the only one recorded in this country appears to be that of Alexander (1938). Two more are reported here.

CASE 1.—A man aged 44; previous health excellent. On Aug. 13, 1940, he was engaged in "tocking" a hedge when he passed a wasps' nest; one of his fellow workers saw him brush his hand across his face and asked him if he had been stung; he said no. A minute or so later he said he thought he must have been stung and his fellow on approaching saw the mark of the sting on the right temple. The man's face became suffused and almost immediately he collapsed on the road; he was at once put into a lorry and taken to the doctor, arriving within 20 minutes from the time of the sting; by that time life was extinct. At autopsy, performed by Dr. Trevor Hughes, a minute puncture surrounded by an area of inflammation was visible on the right temple. The thymus appeared to be enlarged but was not examined microscopically. The pericardial sac contained excess of clear fluid; the lungs were congested and the cut surfaces exuded some blood-stained fluid; the coronary vessels were healthy; no evidence of disease or anything pointing to a cause other than the wasp-sting was found in any of the organs examined.

The deceased's employers rejected liability for compensation. The case in due course went before the county court, which accepted the view that death was due to the wasp-sting and made full award to the dependants.

CASE 2.—A children's nurse aged about 60. She was lunching with her charges, two little girls, and a maid had just brought in the pudding and left the room when a wasp stung the nurse on the back of the neck. One of the girls, with commendable presence of mind, put ammonia on the site of the sting and killed the wasp. The deceased served the pudding to her two charges and then told them that she was going to lie down. On her way out of the nursery she rang the bell; she got into the hall outside the door and was found there lying unconscious by the maid who came in answer to the bell. Death occurred shortly after. The time from the infliction of the sting until death was between 10 and 15 minutes. An autopsy, performed by Dr. G. R. Kennedy, revealed no disease of any organs or any cause of death other than the wasp-sting.

The whole subject of severe reactions, fatal or otherwise, following on the stings of the hymenopteræ has been exhaustively considered by Roch (1928) and more lately by Courboullès and Mandillon (1934). Individual cases have been placed on record mainly in the French journals since as early as 1765 (Desbret). Many references will be found in Roch's paper. Other cases have more recently been described by Wagner (1931) and Arntzen (1933).

A study of the fatal cases reveals a remarkable but hitherto apparently unnoticed identity. As in the two cases reported above, the subjects for a minute or so make no particular complaint; they then either fall or lie down; consciousness is lost and death supervenes in about 20 minutes. In some cases, as in one of those reported by Arntzen—urine and fæces are voided. In cases where the point is mentioned at all it is always reported that, as in case 1, reaction around the site of the sting is either slight or absent. All gradations exist between the immediately fatal cases and those presenting the simple local reaction of common experience. In the reports of the more severe but non-fatal reactions it is often stated that the subject appeared to be in imminent danger of death; but no matter how severe the symptoms nor how apparently close the approach of death, all the records agree that if the subject survives for half an hour recovery follows.

The severe non-fatal reactions present the picture usually associated with anaphylactic shock and the symptoms have been widely attributed to this cause. One such comparatively mild case has come within my experience.

CASE 3.—A boy aged 12. Seen at the request of the mother while I was bathing on a seaside holiday. The mother stated that he had been stung by a wasp about an hour before. A few minutes later he said he felt ill, lay down in his tent and lapsed into a drowsy state. Just before I saw him he complained of a generalised burning and irritation of the skin; when seen he was covered from head to foot with urticarial weals; the face was swollen and eyes puffy. He appeared ill and collapsed but not dangerously so. He remained seedy all day but was fully recovered on the morrow.

Allowing for considerable variations in the initial degree of collapse or "shock" this is fairly typical of the picture recorded in the non-fatal cases.

DISCUSSION

Immediately fatal results, accompanied by the same chain of symptoms, have been reported after the stings of bees as well as of wasps, and it seems reasonable to believe that there is no significant difference between the two venoms. Except that, as Roch remarks, "la guêpe est généralement plus redoutée que l'abeille," there is no difference in the symptoms produced by the stings of the two insects.

Arthus (1919) by injecting bee venom intravenously into dogs was able to produce the full picture of anaphylaxis as seen in that animal. He did not state that the train of symptoms produced was actually that of anaphylaxis but described the picture as an "intoxication sero-anaphylatique." At autopsy his dogs showed congestion of the liver, kidneys and meninges and hæmorrhagic and serous effusions.

Post-mortem reports on human subjects dying as the immediate result of wasp-stings are scanty, in all of them it seems to have been assumed that the sting alone could not possibly have caused death and there is a tendency to lay undue stress on slight and probably unimportant departures from the normal. In the light of Arthus's findings, the presence of a serous effusion into the pericardium reported in case 1 above is interesting. The congestion of the meninges found by Arthus in his experimental animals may bear some relationship to the suffusion of the face within a few minutes of the infliction of the sting noted in this case and in others in the literature.

No observations appear to have been made on the chemical nature or pharmacological action of wasp venom. Such work as has been done on the venom of the hymenoptera seems to be confined to that of the bee. Langer (1897) satisfied himself that contrary to current opinion formic acid is not the active principle of the venom; formic acid is present but the venom retains its activity undiminished after this has been driven off. The venom is a highly complex substance including a volatile oil, tryptophane, choline, fatty acids and a water-soluble acid with a hæmolytic effect. The nature of the symptoms suggests that one of the constituents is either histamine or a related substance. Langer differentiated three separate toxic effects following on the intravenous injection of the venom: neurotoxic; cytolytic, affecting endothelial cells; and hæmolytic. The sudden onset of unconsciousness within two or three minutes of the sting is a feature of all fatal cases and may be supposed to be due to the first factor; the serous effusions to the second.

Why the sting of an insect which in many thousands of instances gives rise to nothing beyond mild and transient symptoms should on rare occasions be followed by immediate death must remain largely a matter of conjecture. It is tempting to invoke the aid of "idiosyncrasy" or "hypersensitiveness." In some fatal cases (as in one of those of Arntzen) it is recorded that the subject had previously experienced violent symptoms after stings. In other cases of fatal or very severe reactions, however, the subjects had previously sustained stings followed by nothing beyond the usual mild symptoms.

Hubert's (1926) case is interesting. A man was stung by a wasp at about 9 A.M. with no effects beyond the ordinary; an hour later he was stung again on the same arm. In 2 or 3 minutes he collapsed and became unconscious and when seen 20 minutes later he appeared about to die. He survived and developed an intense and general urticaria which subsided in a few hours without further ill effect.

Hubert attributes the symptoms following the second sting to sensitisation from the first; but to suppose that an anaphylactic state could develop in so short a time is against all experimental evidence. Although the symptoms in non-fatal cases bear so close a resemblance to anaphylactic shock it is difficult to believe that they are anaphylactic in the generally understood usage of the term. It seems that some explanation other than sensitisation or idiosyncrasy must be found for the fatal cases. Roch and others have suggested that the immediately fatal and the severe reactions are probably due to the chance entry of the venom directly into the blood-stream. This explanation seems to meet the facts as well as any. Roch points out that dangerous reactions are particularly liable to occur when the site of the sting has a relatively thin covering of skin and is of high vascularity; as examples he mentions the temples, the back of the hand and the lips. In case 1 the sting was on the temple.

In this country there seems, in spite of obvious evidence, to be a reluctance to admit that the sting of one of the common hymenoptera may sometimes be the sole and immediate case of death. As pointed out as far back as 1862 by the Husemanns, this fact has medicolegal implications and demands recognition.

SUMMARY

Death may occur as the immediate result of a single wasp-sting. Two new cases are placed on record, and similar fatal results from the stings of bees are recalled.

All immediately fatal cases show an identical chain of symptoms preceding death; within 2 minutes of the sting the person collapses, consciousness is lost and he dies within half an hour. Subjects surviving for half an hour may show severe symptoms of anaphylactic type but always recover.

I wish to thank Mr. Cyril Jones, of Wrexham, for drawing my attention to case 1, and to Dr. Trevor Hughes and Dr. G. R. Kennedy for details of cases.

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PFEIFFER BACILLUS MENINGITIS

RECOVERY WITH CHEMOTHERAPY

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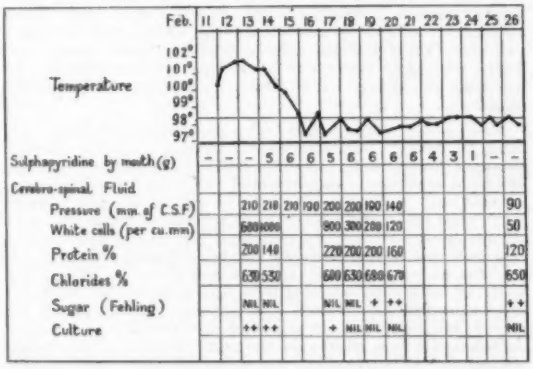
MENINGITIS caused by Pfeiffer's bacillus (*Hæmophilus influenzæ*) is uncommon, and complete recovery from the disease is rare. In the case here described complete recovery followed the administration of sulphapyridine only.

A dustman, aged 59, walked into St. Bartholomew's Hospital on the afternoon of Feb. 11, 1941, complaining bitterly of headache. His illness had begun three days before, with sudden severe headache all over the top of his head. On that day he had felt sick and had three times vomited small quantities of food, but since then had not felt sick or vomited again. The headache got progressively worse and greatly interfered with sleep during the next two nights. The day before his admission he several times experienced giddiness on stooping, and his legs felt so weak that on three occasions he fell. He had no visual disturbance and had suffered no recent injury to the skull, although eight years previously he had sustained a fractured skull, and had subsequently been accustomed to occasional headaches, especially he said when he "had the 'flu."

On examination he was found lying on his side facing the light; he was somewhat drowsy but answered questions both coherently and coöperatively. Temperature 100·4° F., pulse regular with rate of 60, and respirations 24 per min. Both pupils were small but regular, the right being rather smaller than the left, and both reacted briskly to light. There was no neck rigidity: Kernig's and Brudzinski's signs were both negative. The tendon reflexes in both arms and legs were all present and normal, and both plantar responses were flexor. There was no herpes and both ears were normal.

At first it was believed that he was experiencing an exacerbation of headache due to yet another attack of "influenza."



During the next 24 hours, however, his headache got worse, and he could be seen clasping his head between his hands; he had not slept at all and seemed more drowsy. Although there was still no sign of neck rigidity, the physical signs remaining the same as on admission, it was decided to examine his cerebrospinal fluid. Lumbar puncture was therefore performed and 30 c.cm. of a faintly turbid yellowish fluid was withdrawn at a pressure of 210 mm. of C.S.F. The fluid contained 600 cells per c.mm., most of them polymorphs. A gram film of the centrifuged deposit revealed no organisms, but culture on blood agar yielded a pure growth of a small, gram-negative, rather pleomorphic bacillus, morphologically and culturally resembling Pfeiffer's bacillus. It was decided to treat the case with sulphapyridine, 2 g. by mouth followed by 1 g. four-hourly, with daily lumbar puncture to reduce the pressure to approximately normal to relieve headache and provide drainage. He became afebrile within 48 hours of beginning this treatment (see figure), although culture of the C.S.F. was positive three days later. Clinically, his improvement was less striking; apart from temporary remissions following lumbar puncture his headache continued to trouble him with decreasing severity until eight days after treatment began, when it disappeared altogether. His progress proceeded satisfactorily and was marred only by the disturbingly late appearance of neck rigidity nine days after admission—due to a carbuncle on the back of the neck, which also healed with treatment! In all, he received 54 g. of sulphapyridine without ill effect, his white-cell count on Feb. 26 being 12,000 per c.mm. On the 23rd day after admission he was transferred to a convalescent home feeling well and without symptoms.

COMMENT

Pfeiffer bacillus meningitis occasionally follows disease of the middle ear, but usually it arises as a primary disease. The strain causing meningitis is believed to be distinct from those which commonly affect the bronchial tree, and may readily be distinguished from them by bacteriological means (Pittman 1931). Under the age of two years this type of meningitis is relatively common, Pfeiffer's bacillus then being the third commonest organism causing meningitis, following closely after the tubercle bacillus and meningococcus. It becomes progressively rarer with increasing age and is very uncommon in adults.

Up to 1930 the fatality, irrespective of age, was estimated by Silverthorne and others (1937) to be 98·6%. At this time there was no standard treatment: repeated

lumbar punctures were usually performed, and a single recovery was recorded after intravenous colloidal silver injections. Since 1935 most cases have been treated by the method described by Fothergill, which consisted in antisera and human complement administered both intrathecally and intramuscularly. According to Lindsay and others (1940), this method reduced the fatality to 83%. Since 1937 drugs of the sulphonamide group have been used in combination with serum and complement and the fatality has fallen to [illegible], (Lindsay et al. 1940). Treatment by chemotherapy alone has been less often tried. Teggart (1938) records complete recovery in a man aged 60 after 63 g. of soluseptasine, and some 9 cases have been reported in the English journals of recovery after sulphapyridine alone, although most of these were in young children. Experiments recorded by Jacobsen and Neter (1940) suggest that sulphapyridine is the drug of choice.

I am grateful to Dr. E. F. Scowen for permission to publish the case, and to Dr. B. M. Wright for carrying out the many pathological investigations.

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BLOOD AMINO-ACIDS IN HÆMATEMESIS

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It has been known for some years that severe hæmorrhage into the stomach or duodenum is followed within a few hours by a notable rise in both the non-protein nitrogen and the blood-urea. The raised values persist for 24–48 hours and then fall to normal, except in those cases where hæmorrhage continues or extreme limitation of the food and fluid intake leads to dehydration and exhaustion. The rise in the blood-urea nitrogen is sufficient to account for the greater part of the rise in non-protein nitrogen, but the amount of residual nitrogen (non-protein nitrogen less urea nitrogen) is sometimes large enough to suggest an increase in some other nitrogenous constituent of the blood, the most likely being the amino-acids. Moreover, in other types of extra-renal azotæmia large increases of residual nitrogen have been reported (Nonnenbruch 1939). It was therefore decided to determine the amino-acid nitrogen of the blood in a number of patients with azotæmia secondary to gastro-duodenal hæmorrhage.

METHODS AND RESULTS

Amino-acid nitrogen was estimated by the gasometric method (Peters and Van Slyke 1931), normal value 5–9 mg. per 100 c.cm.; non-protein nitrogen by the micro-Kjeldahl method, normal value 25–50 mg. per 100 c.cm.; and urea nitrogen by the urease and nesslerisation method (Archer and Robb 1925), normal value 7–20 mg. per 100 c.cm.

Observations were made on seven patients with hæmatemesis. In five they were made at the height of azotæmia, and again after recovery, except in one patient, who died within a few hours of admission; the results are given in the table, cases 1–5. More frequent estimations were carried out on two further patients (cases 6 and 7). The data in all seven cases show an increase in amino-acid nitrogen at the time of bleeding, the average being 15·2 mg. per 100 c.cm. This increase is specially striking in view of the anæmia which most of the patients showed, since the amino-acid content of plasma is only about a fifth of that of the red cells (Martens 1928), and one might therefore have expected low amino-acid values in these anæmic patients. It is noteworthy that the highest value found (20 mg. per 100 c.cm.) was in a patient (case 2) whose hæmoglobin was 96%; presumably blood dilution had not occurred by the time the sample was taken. The amino-acid nitrogen fell as recovery took place; normal figures were reached in some of the patients before they left hospital, in others a slightly raised amino-acid nitrogen persisted into the recovery phase. While there was a general correspondence between urea and amino-acid values, blood-urea was not necessarily highest at the same time as the amino-acid nitrogen.

OBSERVATIONS ON SEVEN CASES OF AZOTÆMIA SECONDARY TO HÆMATEMESIS

Patient	Date	Hb. % (Haldane)	Nitrogen (mg. per 100 c.cm.			
			Non-protein	Urea	Residual	Amino-acid
1.	Aug. 8, 1940	38	58	34	24	16·5
	Oct. 2, ,,	70	36	15	21	12
2.	Sept. 2, ,,	96	58	32	26	20
	Oct. 9, ,,	80	28	15	13	6·5
3.	Aug. 12, ,,	56	67	47	20	11
	Sept. 11, ,,	62	40	20	20	5·4
4.	Oct. 10, ,,	52	90	70	20	16
	Nov. 1, ,,	80	..	37	..	11
5.	Nov. 12, ,,	..	210	121	89	19
6.	Feb. 12, 1941	48	90	56	34	11·1
	,, 13, ,,	..	..	49	..	12·2
	,, 15, ,,	54	47	19	28	9·7
	,, 17, ,,	..	44	14	30	9·9
	,, 19, ,,	..	34	16	18	9·3
	March 3, ,,	70	36	15	18	8·9
7.	March 24, ,,	60	46	30	16	12·6
	,, 26, ,,	56	52	24	28	10·4
	,, 28, ,,	..	50	24	26	11·4
	,, 31, ,,	58	39	15	24	9·9
	April 29, ,,	82	36	10	26	9·6

DISCUSSION

There can be little doubt that in the patients studied there was an unusually high entry of amino-acids into the blood-stream, not only from the mass of blood protein undergoing digestion in the alimentary tract but possibly also from breakdown of tissue protein (Black and Leese 1940). In health and in most diseases, however, the liver is well able to convert into urea any excess of amino-acids which enters the blood-stream, and little change in the amino-acid content of the blood follows the ingestion even of large amounts of protein. Nonnenbruch (1939) believes that a raised blood-urea indicates renal damage, but that an increase in residual nitrogen, which includes amino-acid nitrogen, is due to liver dysfunction. On this basis there would seem to be in our patients some degree of hepatic dysfunction. The amount of hepatic impairment is no greater than could be accounted for by a mild degree of tissue anoxia. The condition of the blood and circulation in patients who have had severe hæmorrhage is such that significant tissue anoxia is probably present in all the organs, and there is objective evidence of cardiac muscle anoxia in the electrocardiographic changes described by Aschenbrenner (1934). The small degree of impairment of hepatic function is particularly striking when compared with the severe renal impairment which is suggested by the high blood-urea, and demonstrated by the fall in urea and inulin clearance (Black et al. 1941).

The explanation of the very different extent to which hepatic and renal function are affected seems to lie in the arrangement of the circulation to these organs. The liver receives its main blood-supply at a comparatively low pressure from the portal vein, and all the blood coming from the intestine has to pass through it; it is therefore little affected by fall in systemic blood-pressure, and amino-acids absorbed from the bowel are exposed to deamination in the liver before entering the systemic circulation. On the other hand, the efficiency of glomerular filtration depends greatly on the state of the systemic circulation; Powell, Smith and I (1941) have shown that the renal insufficiency in hæmatemesis is largely due to a fall in blood-volume and blood-pressure leading to a diminished circulation through the kidney.

SUMMARY

The amino-acid nitrogen of the blood has been determined in seven patients with azotæmia secondary to gastroduodenal hæmorrhage, and was found to be increased.

The increase probably indicates hepatic dysfunction, though this is slight compared with the renal impairment which can be demonstrated by other methods.

The disparity between hepatic and renal functional impairment may be due to the greater importance of circulatory factors in renal than in hepatic function.

I am indebted to Prof. L. J. Witts for reading the manuscript. The blood-urea estimations were made by Mr. L. Rawlings.

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ANGINAL SYMPTOMS ARISING FROM HYPOTHYROIDISM

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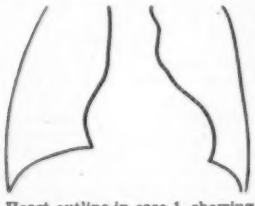
IN 1923 I called attention to the fact that among patients with a so-called vagus heart (or, as I have named it, a neurohypotonic heart) there are a number whose condition can be related to hypothyroidism (Zondek 1923a). The main signs of this syndrome are a tendency to cardiac dilatation (mostly in the form of a pointed, sometimes rounded, dilatation of the left ventricle), bradycardia and low blood-pressure. The electrocardiogram often shows flattening of the P and T waves, the latter sometimes being negative. The P-R interval is sometimes prolonged. Subjectively, anginal symptoms predominate, sometimes amounting to status anginosus. Relatively small doses of thyroid extract improve the patient's condition and bring about a regression of the signs, thus demonstrating the hypothyroid genesis of the condition.

In 1923 I reported the following case.

CASE 1.—A man of 35. Nothing of importance in the history; no infectious diseases, no syphilis and no history of alcoholism. Since youth he had had slight cardiac discomfort, especially after exertion. His pulse-rate had been slow (56–60) since he was a child. There was considerable dilatation of his left ventricle (see figure) and changing systolic murmurs in all areas. Heart action was feeble, and the blood-pressure low (60/95 mm. Hg). In the electrocardiogram the P wave was low and S-T negative. Wassermann negative. All previous therapy had failed. I gave the patient thyroid extract, 0·3 g., daily, and after 2–3 weeks of treatment he felt much better and was able to climb stairs without becoming dyspnœic; his pulse-rate increased to 60–70. After 4 weeks' treatment a change in the heart shadow could be demonstrated radiologically, there being a reduction of the transverse diameter by 1·2 cm.



Heart outline in case 1, showing dilatation of left ventricle.

Some time ago Beaumont and Robertson (1939) called attention to the same condition; apparently they had not seen my 1923 report. They described cases in which anginal symptoms yielded to thyroid treatment after having been refractory to other measures. During the last few years I have seen quite a large number of patients, mostly of middle age, in whom I found my previous observations confirmed. They complained of pain or substernal distress and compression, or sometimes only of troublesome tightness in the precordial region. They often found it difficult to describe clearly what they felt, but the sensations were always more or less continuous, whereas true anginal attacks were rare. Three patients had attacks characterised by collapse, extreme pallor, cold sweating and severe oppression in the precordial region; the pulse was small and slow. The heart was dilated in most cases but never to the extent observed in the first case reported. These patients showed no obvious signs of myxœdema, but the basal metabolic rate was decreased and the blood-cholesterol increased, reaching values as high as 400 mg. per 100 c.cm. Apparently, as in true myxœdema, the increase in blood-cholesterol is an early symptom. The capillaries appeared, on examination with a lens, to be constricted and reduced in number and circulation in them was found to be slow—an appearance characteristic of myxœdema.* Electrocardiographic changes did not suggest that myxœdematous heart changes had developed so far. These anginal cases were improved hardly, if at all, by Diuretin, nitrites, atropine, calcium and so on, but responded quickly to thyroid.

CASE-HISTORIES

CASE 2.—A married woman aged 50. In childhood she had had jaundice, scarlet fever and rubella. She had always been anæmic. At the age of 36 hysterectomy and bilateral ovariectomy were carried out for fibroids; 3 years before I saw her she had developed Graves's disease. After having been treated with iodine for about a year, she recovered completely. Lately, she has been complaining of general weakness, nausea and giddiness, especially during the change from the horizontal to the vertical position, and oppression in the precordial region with radiation of pain to the back. She was admitted to hospital in a state of collapse, pale and with cold wet extremities, but not unconscious. Her pulse was small and slow (52–70). Her appearance did not suggest myxœdema. A slight, soft, diffuse goitre was present. Heart: slight dilatation of the aorta, otherwise not enlarged; heart sounds soft. Blood-pressure 110/80 mm. Hg. No special findings in the other organs. Blood-cholesterol 258 mg. per 100 c.cm. Circulation time (as tested with magnesium sulphate) 14–15 sec. B.M.R. −18·5%. Blood sedimentation-rate (Linzenmeier), 3 hr. 10 min. Blood-count: red cells 4,500,000; Hb. 76%; white cells 5000 (polymorphs 56%, lymphocytes 40%, eosinophils 2%, monocytes 2%). Capillaries: some appeared very narrow and some normal. Electrocardiogram: no pathological changes. Treatment: atropine (1 in 1000) ℥ 10, three times a day; calcium-papaverine intravenously. The patient felt slightly better, but was still suffering from severe dizziness; pulse-rate 52. A week later thyroid therapy was begun; a 5-day course of 0·1 g. a day was given followed by an interval of 2 days. After 4 weeks the patient felt better; the precordial oppression had disappeared and so had the general weakness and dizziness. Pulse-rate 72, blood-cholesterol 210 mg.; B.M.R. −12%; circulation time 16 sec. Some capillaries still narrow and some dilated. After another 2 weeks, during which a daily dose of thyroid (P. D. and Co.) gr. 2 was administered, she was completely well and fit for work. B.M.R. −9%.

CASE 3.—A man aged 38. No important previous illness. Seen on June 7, 1939: for about a year he had noticed general weakness. At times, sudden overwhelming weakness obliged him to stop speaking. Appetite good, bowels regular. Not much change in body-weight. He found hot weather pleasant, and stood cold badly. No other signs indicating myxœdema. Heart normal in size; sounds clear. Pulse-rate 60. Blood-pressure 98/70 mm. Hg. Reflexes active. Urine normal. Blood-count normal. Blood sedimentation-rate (Westergren) 2 mm. The patient was given benzedrine. By March 7, 1940, he was feeling better and had discontinued the benzedrine. Then he began to complain of attacks of malaise and discomfort accompanied by oppression and pain in the precordial region. Blood-pressure 100/60 mm. Hg when sitting; systolic 95 when lying. Pulse-rate 60. Exercise-tolerance test: after 10 genuflections pulse-rate rose to 100, returning to 60 after 1½ min. Compression of the carotid sinus produced no undue slowing of the pulse-rate. Capillaries narrow, some showing saddle and dome forms. The patient was given ephedrine. On Aug. 3 he collapsed, during the night, with severe distress increasing to a fear of impending death. The physician attending him found a remarkably slow pulse-rate. After some time the patient recovered. On Aug. 5 his B.M.R. was −13%. Circulation time 16 sec. Electrocardiogram: frequency 68; very low deflections in lead 1, R. 0·15 mV. In the second and third leads deflections were slightly higher, R. 0·6 and 0·5 mV respectively; S_2 and S_3 present. No other changes. In the thoracic lead (lead 2) deflections were very low. In the last few days precordial distress had been commoner. He was then given thyroid extract, 0·1 g., daily. By Aug. 23 he was feeling completely well. The cardiac distress had disappeared and no further collapse had taken place. In October thyroid therapy was discontinued for 4 weeks, after

* Unpublished observation of H. Zondek, Michael and Kaatz.

which the patient came back with all his former symptoms. Resumption of thyroid treatment was again effective.

DISCUSSION

The differential diagnosis between this syndrome and that described as angina pectoris vasomotoria of vagotonic origin deserves consideration. The symptoms and some of the signs of the latter are similar to those found in cases 1, 2 and 3 above. In angina pectoris vasomotoria, the left ventricle is often dilated in a rounded or pointed manner and the patient has a tendency towards bradycardia, and a low blood-pressure with cold extremities and pallor (pseudo-anæmia); the capillaries appear normal, however, in most cases. Electrocardiography sometimes shows low waves and prolonged P-R intervals. The B.M.R., too, may be decreased; I have found values as low as −30% in such cases. Characteristically the values oscillate considerably, in contrast to those found in hypothyroidic patients. In collaboration with Dr. Kaatz I obtained the following values at intervals of 4 weeks,

Case 4	Case 5	Case 6
−12·6%	−17%	−30%
−30%	−3%	−13%
Normal	−22%	−10%

Patients with the syndrome I have just described also show a dilated heart with a rounded or pointed left ventricle, a tendency to bradycardia and a low blood-pressure; the heart sounds are soft. The electrocardiogram is often normal, but in some cases shows changes similar to those found in myxœdematous patients. The B.M.R. is abnormally low, the circulation time usually prolonged, and the blood-cholesterol level high. Thus, the circulatory system regularly shows some but not all of the typical signs of myxœdematous heart. We may therefore speak of an "abortive myxœdematous heart." In this condition symptoms subside on administration of thyroid (0·5–0·6 g. thyroideum siccum weekly); this should be discontinued as soon as tachycardia develops and resumed only if bradycardia recurs. The hypofunction of the thyroid gland causes decreased sympathetic action on the heart and a resultant increase in the vagal action. Primary vagotonia, as we have seen, produces angina pectoris vasomotoria, which is in many respects similar to the hypothyroid syndrome. It is difficult, therefore, to decide whether symptoms are caused by a primary vagotonia or by relative vagotonia resulting from hypothyroidism, and at times it can only be settled by the therapeutic test—that is, by giving thyroid.

In case 2 the differential diagnosis was made easier by the history that the patient had previously suffered from Graves's disease, had recovered completely and then swung to the opposite extreme, developing an abortive myxœdematous heart. The transformation of Graves's disease into myxœdema has, of course, often been reported by myself and others (Zondek 1923b).

Drugs depressing vagal action may also have a good effect in hypothyroid heart cases because of the relative vagotonia present. Complete success, however, can only be obtained with thyroid. Thyroid acts, I think, by reducing the tissue-fluids, and thus dehydrating the heart muscle. In 1918 I demonstrated that the fluid content of myxœdematous heart muscle is abnormally high; this has been confirmed by Webster and Cooke (1936). Lately, in coöperation with Kaatz and Michael, I have been able to prove that the capillaries of hypothyroid patients are usually very narrow, with slow circulation. In some cases only the loops of the capillaries are to be seen in the form of small hooks, while the limbs are completely invisible. It seems that the pressure of the increased tissue fluids compresses the capillary walls, causing deficient blood-flow. The capillaries gradually become normal under the influence of thyroid. It is reasonable to suppose that similar changes occur in the heart vessels and that thyroid improves the cardiac circulation, relieving symptoms by dehydrating the heart muscle and easing the pressure on the small vessels supplying it.

The favourable effects of thyroid on patients with anginal symptoms have special interest in view of the recommendation, made recently, of thyroidectomy in the treatment of angina pectoris. Cases of angina pectoris which improve on partial thyroidectomy represent a syndrome fundamentally different from that described in this paper. The pathological process, in such cases, is sclerosis of the coronary vessels; if the thyroid hormone is eliminated there is a decrease in sympathetic tonus, and thus probably a decrease in the oxygen requirements of the myocardium and in the work of the heart. Thyroid therapy in such cases may produce an increase in symptoms. This may also occur occasionally in myxœdematous patients, especially after prolonged thyroid administration, since arteriosclerotic changes of the vessels are not at all rare among the middle-aged. Thus the causes of anginal symptoms in cases with fully developed or abortive myxœdematous hearts may be various.

SUMMARY

The possibility of hypothyroidism must be kept in mind in treating patients with anginal symptoms. Precordial distress and substernal pain, collapse recurring more or less frequently and accompanied by pallor, considerable fall in blood-pressure, bradycardia and a small pulse seem to be characteristic of the condition. The circulatory system shows signs typical of true myxœdematous hearts—cardiac dilatation of varying degree, a tendency to bradycardia and low blood-pressure. In some cases the electrocardiogram shows changes corresponding to those found in myxœdema (flattening of P and T waves, negative T wave), in other cases there are no abnormal findings. The peripheral vessels (capillaries) are narrow and circulation is slowed. The basal metabolism is decreased, the blood-cholesterol level high (values as high as 400 mg. per 100 c.cm. have been recorded). High blood-cholesterol is characteristic, and is often the earliest sign of the disease, as it is in fully developed myxœdema. An increase in tissue fluids, including those of the myocardium, leads to a secondary compression of the small cardiac vessels, causing an "imbibition angina." Therapeutically, small doses of thyroid (0·5–0·7 g. weekly) are effective as a rule. The treatment should be continued for several weeks with short interruptions, and should be repeated when bradycardia reappears. Thyroid probably acts by dehydrating the heart muscle. The cardiovascular syndrome here described may be designated "abortive myxœdematous heart." The ordinary vagal heart (primary vagotonia) may be accompanied by symptoms and signs similar to those of the condition described. The symptoms of such patients subside on administration of drugs decreasing the vagal tonus or causing vasodilatation (calcium, papaverine, atropine, diuretin or small doses of phenobarbital).

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INTESTINAL DAMAGE FROM A SMALL WOUND

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THE following case was one of many air-raid casualties admitted to hospital on the same night.

A married woman, aged 27, was admitted from a bombed building within ½–1 hour of the incident. She had heard "something coming down" (a very large high-explosive bomb) and had quickly lain down prone. Immediately after the explosion she felt a pain in the abdomen. On admission to hospital she was pale and a little shocked; pulse-rate 80, fair volume; respirations normal but with limited abdominal movement; temperature just under normal. She complained of abdominal pain, generalised but of only moderate severity, and there was slight tenderness and rigidity. One minute wound about ¼ in. long in the right buttock just above the tuber ischii was the only external trauma visible. The patient was unaware of this and no point of entry in her clothing has subsequently been found. She was obviously badly frightened by the experience and a bromide and chloral sedative was given and shock treatment instituted. After 1½ hours, in view of persistent and increasing abdominal pain and in spite of a steady pulse, it was

decided to explore the abdomen. At that time the abdomen was slightly rigid and very tender, moving poorly; liver dullness was present and no free fluid was definitely identified.

Under gas, oxygen and ether anæsthesia a small para-umbilical incision was made. Blood and fluid and solid fæces welled into the wound. In all 16 entrance and exit wounds were found at intervals of about 8 in. along the small gut with characteristic pouting mucous membrane, each oozing bowel contents and blood. The largest admitted two fingers and the majority were ½–¾ in. across. One or two of the in and out wounds were confluent where the bomb casing had bitten out the antimesenteric border of the bowel and one perforation involved the mesentery as well as the adjacent bowel. A solitary perforation of the lower sigmoid colon discharging solid fæces was also present. The various perforations were repaired as rapidly as possible in the transverse axis of the gut by two-layer inverting eyeless-needle sutures and after evacuation of the bulk of the free blood and intestinal contents, inspection of the liver and palpation of the spleen and left kidney the abdomen was closed with pelvic tube drainage. Nothing more was done beyond the application of a small dressing to the entrance wound. The repair took about 1½ hours.

She was given a small blood-transfusion and for 4½ days subsequently fluids were supplied by intravenous drip (saline-glucose 5%), only small sips of fluid being allowed by mouth. Morphia was given liberally. Prophylactically, M. & B. 693 soluble (intravenous) was given via the drip tubing, one ampoule 6-hourly for 4 days.

The bowel remained silent and apparently completely inactive for 4½ days. No colic was felt and no flatus and only minor postoperative vomiting was noted. On the 5th day there was slight distention and much flatus was passed. The drainage-tube which was removed after 48 hours left a track from which sero-pus containing *Bacillus coli* continued to drain for 3 weeks. Feeding was started on the 5th day with citrated iced milk and, for want of oranges, rhubarb juice, which she tolerated well as opposed to sweet drinks. On the 14th day evidence of a pelvic collection—diarrhœa and a tender mass in the pouch of Douglas with fixation of the pelvic organs—was discovered, and signs of deep suppuration in the buttock were evident. Opportunity was awaited to open the pelvic abscess per vaginam but 3 days later the buttock wound discharged about ½ pint of pus and the pelvic inflammation started to resolve. A threatened obstruction with visible peristalsis and distention evidently centred about the terminal ileum also resolved along with the pelvic condition and may have been due to ileus duplex.

Now, 4 weeks after the original injury, she is getting about fairly well in the ward and eating ordinary diet. Occasional very mild colic and a feeling of being lost without her manytail binder are her only complaints.

This case seems to emphasise the importance of small wounds in war surgery where vital structures can be badly damaged by minute particles of high-speed shrapnel. In this case the shrapnel is still lodged in the left perirenal area having reached there via the right buttock, right iliac bone, large gut, small gut and posterior peritoneum. Her recovery is due to (1) careful examination by the receiving room staff with denial of morphia; (2) a well-given anæsthetic under difficulties; (3) unremitting aftercare by nursing staff and students, of whom the latter spent many sleepless nights attending to the case; and (4) morphia and intravenous saline which allowed the gut to rest and heal.

I am grateful to Mr. G. M. Gray, medical superintendent, for permission to publish the case.

Reviews of Books

Macleod's Physiology in Modern Medicine

(9th ed.) Edited by PHILIP BARD, professor of physiology at the Johns Hopkins University. London: Henry Kimpton. Pp. 1256. 50*s*.

EIGHT principal and three subsidiary authors (one of whom, W. S. Root, is not mentioned on the title page) have contributed to this book. The sections on the nervous system (Philip Bard), the circulation (H. C. Bazett), respiration (C. F. Schmidt), the distribution and regulation of water and the kidney (M. I. Gregersen) are very well done, and in parts outstanding. H. J. Curtis's lucid treatment of excitation and the nerve impulse is fully in keeping with the high standard of the section on the nervous system. The special-sense section (J. M. D. Olmsted) is adequate for medical students, but superficial in parts. The subject of metabolism and nutrition, admittedly one of great diversity, receives a somewhat patchy treatment by C. L. Gemmill. He begins well, but tends to tail off into the style of a review in which many findings are mentioned to the detriment of the exposition of fundamentals; the style becomes too hurried for a textbook. G. R. Cowgill's chapters on the alimentary tract are sound, placid and dignified, but would be improved by more illustrations and tables. The endocrine glands, and what there is about reproduction, are dealt with in 68 pages by R. G. Hoskins, and the exposition is clear. The space accorded to these subjects in textbooks of physiology is traditionally small, but it is disappointing to find it still restricted in a book which is above all things modern. A lesser example of lack of balance is seen in the 19 pages devoted to coagulation of the blood (3 in small print on clinical aspects) as against 5 on the urinary bladder. Nevertheless this is one of the best of modern textbooks of physiology. It contains upwards of 2000 references to original literature and authoritative sources; the table of contents is exhaustive, the index good, and it is beautifully produced and strongly bound. The pale green tint of the pages is congenial to the eye.

Williams's Obstetrics

(8th ed.) By H. J. STANDER, M.D., F.A.C.S. London: D. Appleton Century. Pp. 1401. 55*s*.

IN 1934 Professor Stander revised, and thus rejuvenated, the last edition of Dr. Whitridge Williams's textbook of obstetrics, which on its own merits ranked as the premier reference textbook in obstetrics in the English language. The new edition is completely rewritten and little of the original text remains, though the form is to some extent retained. For sentimental reasons it is still called "Williams," but is in fact almost pure Stander. The illustrations and diagrams are excellent and it covers every aspect of its subject. The final-year student can read and enjoy it, but its chief appeal will be to the more advanced practitioner who intends to specialise in obstetrics. At the end of each chapter there is a generous bibliography in all languages. The classification of the toxæmias of pregnancy will not, perhaps, be acceptable to British obstetricians—and so much the better. The chapter on radiological pelvimetry is an eye-opener and shows us up badly in this country; it should be read by all who propose to perform measurement of the female pelvis by radiography. Every English obstetrician who wishes to broaden his views beyond the orthodox and accepted teachings of his own school will value this as the splendid book it is.

Pharmacological Basis of Therapeutics

By LOUIS GOODMAN, M.D., and ALFRED GILMAN, Ph.D., assistant professors of pharmacology and toxicology, Yale University school of medicine. London: Macmillan and Co. Pp. 1325. 50*s*.

THIS is one of the most comprehensive books at present available on pharmacology from the clinician's point of view. The material offered to the reader is inevitably much the same as in other detailed works on the subject, but the presentation is different in several important particulars. By sifting the many doubtful theories which have gained credence through frequent repetition, the authors have made the subject more reasonable and therefore more readable than usual. References to original work are included, but no attempt has been made to give exhaustive abstracts of the literature; examples serve the main purpose of the book—to illustrate the application of drugs in medical treatment. They discuss drugs according to the system of the body on which their action is greatest. This is natural, having regard to the therapeutic approach which has been adopted; but they have evidently shared the experience of other writers in finding the heavy metals, the vitamins and the gases an awkward squad to classify. Toxicology is dealt with in unusual detail, but is carefully correlated with pharmacological action. There is a useful appendix on prescription writing for the student.

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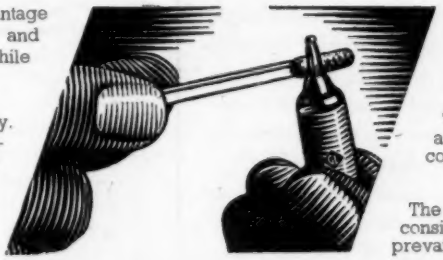

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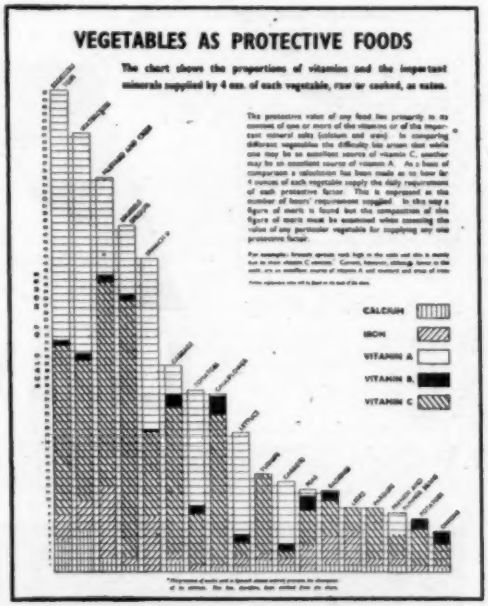
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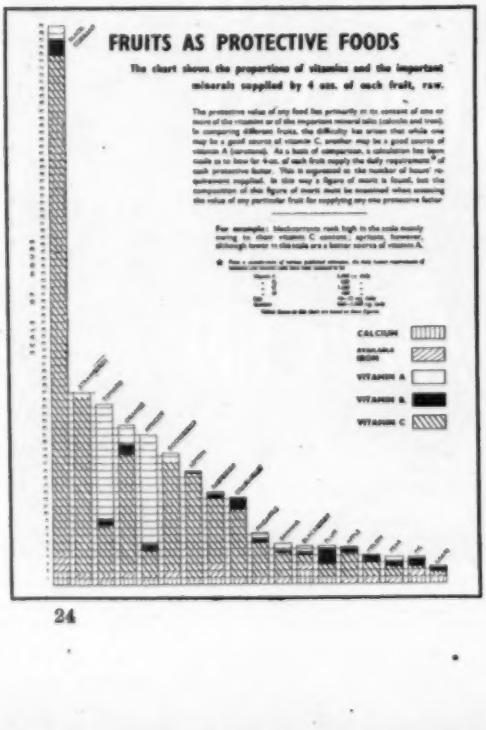
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THE LANCET

LONDON: SATURDAY, SEPTEMBER 13, 1941

FIRST-AID FOR EVERY SOLDIER

WITH the open order attack of the British Army, as devised in the Sudan, developed in South Africa, practised on Salisbury Plain and used in mobile warfare during the last war by regulars in the battle of the Marne and by territorial and dominion troops in Palestine later, there were two possible views as to the tactical use of field-ambulance stretcher-bearers. One was to keep them back so that they would not be wounded and have to be carried off by their fellows who should be stretchering wounded combatant troops. The other was to keep them right up behind the supports where they could get to work on the wounded at once, and where the combatant troops going into action would see them and know that if they were hit they were certain of being given first-aid quickly. Of the value of this to morale there can be no doubt. Time may change the superficial appearances of war as of medicine, the principles that underlie both are immutable; and the principles of medicine say that first-aid must be immediate and those of war say that the man fights better if he knows he has a chance if he is hit. But today there is no front line, no firing line to be built up by the incorporation of supports behind which the stretcher-bearers can advance and pick up wounded as they fall. There are little pockets of men all over the place—France, Greece, Russia, tell the same tale—and if the man is to get first-aid he must get it from his mates. An unnamed lance-corporal of the line wrote this in THE LANCET of Feb. 15 (p. 231):

> Soldiers expect to take risks, but some of the men with whom I served in France need not have died and many more are today minus limbs who might still be whole. One of the important lessons we learned in France was the prevention, as far as possible, of serious casualties. A wounded soldier is a liability to himself and everyone else, and practical first-aid should be included in a recruit's syllabus. A soldier is taught how to kill and destroy, how to operate and fire his weapons, and the best way to protect himself against similar weapons, but not one lesson does he receive on how to save his comrade's life.

And now there comes a soldier-doctor to tell how it should be done. Mr. CHARLES KEOGH was a combatant in the last war and became a medical student after it. Thus he knew the soldier, knows what he needs, and knows how to give it him. He has produced a card called "First-aid for Fighting Men"[1] which contains—in twenty brief paragraphs and ten striking sketches—all that the fighting man *need* know of the subject. "First-aid saves lives and stops panic," he says; a principle of medicine which combines the physical with the mental. "A lightly wounded man, if given first-aid, can go on fighting"; a principle of war which says that the first duty of the doctor is to keep men fit and fighting. Of a badly wounded man he writes: "Treat him like a child. Calm him. Calm the men in your post. This is first-aid." There is beauty in this, the beauty of experience and of the mind that in tending one does not forget others, and finds the two the same. "Any fool can be brave and get killed; be brave and don't get killed, and save your friend instead." Brave words and true. "A man bleeds to death very quickly. Stop it with your hands. There is no time to wash." A rigid coherence to the formalities of operative technique is far too often insisted on in teaching these things today. "Give any wounded man a drink of anything you have—but do not give a drink to a man with a wound in the belly, or to a man who cannot swallow. You will kill him if you do." We do not yet know what shock is, but no-one has put what we do know better than this: "Shock kills more men than bullets. Shock is a mixture of pain, fear and cold. Do what you can to stop all three. Shock kills brave men." The card ends with: "Courage in disaster. Courage in the presence of a wounded man. First-aid can save a situation and save a friend."

FIG. 2

8. IF YOU CAN'T STOP IT that way, slip a piece of string round the leg or arm higher up. A pull-through or sling will do, tie it over his uniform. Tie one knot (fig. 2). Put a pencil or piece of wood on the knot (fig. 3). Tie twice over the stick. Tie a reef knot. Tie any knot if you don't know how (figs. 4 & 5). Twist the stick until the bleeding stops. Keep it in position by tying the ends down (fig. 6.) This is a Tourniquet.

FIG. 3

FIG. 4

9. A TOURNIQUET can save a life and a limb. It can also kill a limb. Loosen a tourniquet every quarter of an hour. Four times an hour. If you don't, the limb will die.

FIG. 5

10. IN WAR, a wounded man may be hours or days before he gets to a Surgeon. If ever you put on a tourniquet, put a label on. Write "Tourniquet applied 9 a.m. Tuesday. Loosen four times an hour. Tighten again if bleeding starts." Fix the label where it can be seen (fig. 7).

FIG. 6

11. BROKEN BONES. Place the limb in its most natural position and you can't go wrong. Don't let a broken limb flap. Sharp ends of broken bone can cut arteries and nerves to pieces. Tie a broken arm to the chest with any kind of bandage. But tie it firmly (fig. 8). Tie a broken leg to the other leg. Use as many bandages as possible. Foot to foot, knee to knee, thigh to thigh (fig. 9).

FIG. 7

FIG. 8

12. CARRYING A WOUNDED MAN under fire. Keep under cover. Tie his wrists together. Crawl on hands and knees on top of him. Put your neck under his wrists, and drag him along underneath you. You can go miles this way, and you will not give away the position of your post to the enemy (fig. 10.)

FIG. 9

FIG. 10

13. SMALL PUNCTURED WOUNDS are often more dangerous than dreadful bloody ones. A spent bullet from the air can go right through a man. Punctured wounds must be seen by a Doctor.

This card, if adopted by the Army, should be issued not to every man but to every subaltern with the responsibility of seeing that every man under him knows it by heart. It is for the Adjutant General and the Army Council to decide whether they will take the advice of the nameless lance-corporal and make the rehearsing of its simple precepts part of the training of every soldier.

1. Published by Sifton, Praed & Co., Ltd., St. James's Street, S.W.1. 6d.

HEPARIN AND A RIVAL

WHEN CHARLES and BEST in Canada and JORPES in Sweden purified heparin sufficiently to enable it to be given intravenously to patients, they opened up a wide field of possible therapeutics. Could we, by rendering the blood less coagulable in vivo, control those processes of embolism and thrombosis that are so difficult to treat? Would heparin help in operating on blood-vessels? Were patients liable to serious hæmorrhage when heparinised? The progress made in Sweden was described by various workers at a symposium on heparin held at Stockholm in December last.[1] There was general agreement that heparin is most useful in the treatment of thrombosis of the leg veins, in operations on blood-vessels such as embolectomy, and in the prevention of postoperative thrombosis and embolism. It is now clear that heparin cannot influence a thrombus once it has formed, but if the onset of thrombosis can be detected at a very early stage the process can be aborted by heparinisation of the blood, BAUER[2] finds the classical clinical signs of early thrombosis very unreliable and he uses "venography"—radiographic outlining of the veins after injection of iodoxyl—to decide whether thrombosis is beginning or how far it has progressed. Good results cannot be expected from heparin treatment if the thrombosis has spread to the thigh veins and especially if the femoral vein is involved. If the case is suitable, he gives 100 mg. intravenously three times daily until the pulse and temperature have returned almost to normal; this takes 4–7 days and he then allows the patient to get up. He reports 21 cases successfully treated in this way. LINDGREN and WILANDER[3] record the use of heparin in 8 operations on blood-vessels; 200–300 mg. divided into four intravenous injections was given daily for 4–15 days and good results were obtained in all cases.

The value of heparin as a prophylactic against postoperative thrombosis is more difficult to assess since these accidents are fortunately not common. CRAFOORD and JORPES[4] selected a group of 325 patients all over 30 years of age who had to undergo operations more specially liable to thrombo-embolic complications, such as those on the appendix, gall-bladder, stomach, or male genitalia. They were given regular heparin injections beginning 4 hours after the operation and continuing for 5–10 days. Four intravenous doses of 50, 50, 50 and 100 mg. were given every day, with an interval of 4 hours between each; in some cases the dose was increased. At the end of heparinisation the dose was diminished gradually, because after sudden withdrawal pulmonary embolism sometimes occurred 10–15 days later. No complications were recorded in these 325 patients. As a contrast, over the same period 302 similar cases were operated on without heparinisation; 33 (11%) had definite thrombo-embolic complications and 9 died; in a control series of 809 similar cases from a previous period the incidence of thrombosis and embolism was about the same. Treatment after thrombosis has occurred is far less satisfactory; in some patients there was considerable subjective relief and pulse and temperature rapidly returned to normal, but in many others there was no clear effect. According to MURRAY,[5] similar conclusions and results on all these points have been obtained by Canadian workers, but they prefer to give the heparin in a continuous intravenous drip instead of in separated intravenous doses.

Heparin is non-toxic and can be safely given 4–8 hours after a surgical operation or 24 hours after delivery in obstetrical cases; should excess bleeding occur it can be controlled by a small blood-transfusion or injection of protamine sulphate. But it is unfortunately difficult to make in quantity—the source is ox lung or liver and the yield is small—and it is therefore expensive. Patients with venous thrombosis suitable for heparin treatment are not common, and embolectomy operations are distinctly rare, so that hospitals might be able to bear the expense of individual cases of this sort, but the prophylactic use of heparin involves the treatment of hundreds of patients. At present rates the minimum prophylactic course costs about £6 (plus purchase tax) if the hospital makes its own sterile solution from the dry powder and much more if the heparin solution must be bought. This is obviously not practicable however desirable and MURRAY hopes that some equally non-toxic substance with similar properties will be found that is less expensive. BUTT, ALLEN, and BOLLMAN[6] suggest that a substance with the desired properties has been found in 3,3′-methylene-bis-(4-hydroxycoumarin). This compound is chemically quite different from heparin. It was originally found in hay or silage made from the common sweet clovers which had been improperly cured; this is known to cause a hæmorrhagic disease in cattle. K. P. LINK of the University of Wisconsin and his associates isolated the hæmorrhagic agent of spoiled sweet clover and have succeeded in synthesising it. Preliminary work has shown it to be non-toxic in human patients. It greatly prolongs the coagulation and prothrombin times of the blood but takes about 48 hours to develop its effect; but when the effect is fully developed, it is lasting. It seems best to give it in a series of divided doses and it has the enormous advantage of being active when given by mouth in gelatin capsules. Its effect can be rapidly checked by a small transfusion of normal blood. This substance should be relatively cheap, and may make general preoperative prophylaxis a practical possibility. Let us hope its discoverers will think of a shorter name for it, preferably one that will recall its pastoral origin.

1. *Acta med. Scand.* 1941, **107**, 107. 2. Bauer, G. *Ibid*, p. 136.
3. Lindgren, S. and Wilander, O. *Ibid*, p. 148.
4. Crafoord, C., Jorpes, E. *J. Amer. med. Ass.* June 28, 1941, p. 2831.
5. Murray, G. D. W. *Brit. J. Surg.* 1940, **27**, 567.
6. Butt, H. R., Allen, E. V. and Bollman, J. L. *Proc. Mayo Clin*, June 18, 1941, p. 388.

NURSING RECONSIDERED

ENGLISH nursing is falling off for lack of candidates for training—not merely of suitable candidates, but of sufficient candidates of any kind. The high standards set by the nineteenth century pioneers can only be maintained if the best type of woman in the country is willing to take up nursing. That the cream of our public and secondary school girls—young women of character and promise—at present choose other callings in preference to nursing cannot be said to reflect on the girls. They have plenty of interest in public welfare, applying in large numbers to train as social workers, though appointments for those who qualify are scanty; moreover,

most women have an instinctive bias which makes such nursing as comes their way congenial. When an attractive occupation is neglected the fault must lie in the terms of service.

The establishment of a nursing division at the Ministry of Health is evidence that remedies are being sought, and organisations up and down the country are making suggestions. One proposed state scheme of training for nurses has lately been drawn up, as a basis for discussion, by the Manchester public-health department, in which a plan is set out whereby the nurse might obtain basic general training, and also specialised training, within a period of four years. A wise proposal is that schools of nursing should be attached to the universities so that student nurses would have the same standing as students taking a diploma in social science. This would go far towards bringing a nursing qualification into line with other academic and technical diplomas. At present only two English universities, Leeds and London, give diplomas in nursing, in painful contrast with the copious references in the index of the Universities Yearbook to nursing diplomas in Canada and South Africa. Special training for assistant nurses is also suggested in the Manchester scheme, either in the form of a modified course in hospital, with examinations in practical nursing, or as a special course at approved institutions. If a second grade of ward helper is essential—and in the present straits she certainly is—it is wholly desirable that she should have a defined training and clearly specified duties; she may then prove to be a reliable and even indispensable member of her profession. But it seems at least equally important that she should be designated by some title other than that of nurse. A constructive scheme based on wide inquiry has lately been outlined [1] by four members of the nursing profession who may justly speak with authority—Miss E. C. PEARCE, Mrs. B. A. BENNETT, Miss L. SNOWDEN and Miss G. B. CARTER. They accept the principle that two grades of nurse have become necessary and suggest that students training for grade I standard should hold the school-leaving certificate or a higher qualification and should be in training for 4½ years. Grade II students would be drawn from secondary or elementary schools and need hold no certificates; their training would last 2½ years, terminating in an examination largely practical and oral. They suggest the descriptive term "sister" for the first, and "nurse" for the second grade. Thus to diminish the title of nurse seems unfortunate: surely it should be kept for the state-registered woman, and the term "student nurse" for the woman intending to qualify. For a helper of the second grade some other description must be found (e.g. "ancilla"); to call her a nurse—even an assistant nurse—is to debase the currency of nursing and to invite confusion in the minds of the public.

The Manchester suggestions are timely, but they look at nursing from within. If recruitment is to be improved it is essential to look at the profession through the eyes of the recruit and it is inept to say to her "The welfare of the patient must be the first consideration. The nurse must be prepared to sacrifice herself to that." An appreciation of the patient's claims can only develop fully in a woman who has begun to study nursing and to love her calling. A demand at the outset for sacrifices only alarms the hesitant; and in any case no more sacrifices should be required from a student nurse than from any other young person studying for a profession. Few careers in medicine fail to include a sense of vocation but how many deans of medical schools find themselves extolling sacrifice to prospective students? It is not at the outset a question of money: students in professions other than nursing expect to pay, not to be paid. At the beginning of this year the Minister of Health tried to overcome the shortage of applicants by raising rates of pay and by appealing for more nurses. The rates of pay in the Civil Nursing Reserve were set at £40 a year for student nurses, £105 for trained nurses, £55 for nursing auxiliaries and £70 for assistant nurses, in all cases with board, lodging and laundry allowed. There are objections to this arrangement; at present most auxiliaries and assistant nurses are only partly trained women who for one reason or another are not attempting to become state-registered nurses. They are living in close association with student nurses, and—though having a somewhat lower status—are receiving higher salaries. The establishment of two grades, trained for different purposes, would help to overcome this difficulty. It might then become possible to treat student nurses as true students and pay them nothing; but in that case the hospital should cease to depend on their labour for the care of patients. They should be, like medical students, an accessory not an integral part of the staff. To run hospital nursing largely on student labour, as is done at present, is unjust both to the trained nurse and the nurse in training. It limits the number of posts open to trained women and subordinates the interests of the student to hospital convenience. If she is being paid for service, at however inadequate a rate, the nurse is in a weak position to argue her cause as a student.

The salaries to trained staff are moderate when all emoluments are reckoned in; but part of these emoluments take the form of board and lodging, and the trained nurse is thus compelled to live in hospital—a plan which makes for hospital convenience and economy, but has serious side-effects for the nurse. Few people, male or female, benefit by living in a circumscribed world composed largely of their own sex; maturity of the mind and emotions is difficult to achieve and maintain in such surroundings. Intelligent girls contemplating the profession feel that nurses should have at least as much private liberty as women doing, say, secretarial work; and that they would be the better for it. Nor are the prospects for the older nurse outside hospital such as to inspire confidence in parents seeking a safe livelihood for their daughters, or in the daughters themselves. In private nursing the young nurse is often prized above her seniors. District and school nursing, though giving a measure of freedom, are hard exacting jobs and not particularly well paid. Mental nursing is interesting work and pensionable, but the isolation of many mental hospitals and the need to live in (as well as that uninformed dread of mental patients which is almost universal) deters many; while the higher rates of pay offered attract those who are driven rather by their financial needs or responsibilities than by an interest in mental work.

1. *Nursing Mirror*, Aug. 23.

The logical way out of the recruiting dilemma is to ask the girls themselves what they want and to pay some attention to the answers. These are reasonable enough: they want equal freedom and leisure with other girls in training; prospects of a safe and adequate livelihood; and an opportunity, when training is complete, to live a normal home life outside working hours. And if they cannot get these things they will not flock to become nurses: it is as simple as that. The national committee on nursing which the Minister of Health contemplates setting up is to have panels representing employers and employed. It might be as well to add a third panel composed of parents, headmistresses and possibly of girls leaving school—or at least to hear evidence from these interested and interesting parties. A real appreciation of fundamental issues appears in the scheme drafted by Miss PEARCE and her colleagues, and also in a bill on nursing lately drawn up by the Women's Parliament, at their first session on July 13 last. This bill asks for reorganisation of the training system so that students should not be required to perform full hospital duties simultaneously with their studies; for a forty-eight hour week, with four weeks holiday annually for student nurses and five weeks for trained nurses; that trained nurses shall be allowed to live outside hospital and to continue their employment after marriage; and that nurses' homes for those in training shall be run as hostels, controlled by an elected committee of the residents. There are other suggestions, about rates of pay, pensions, uniform and the training of nursing auxiliaries; but those set out above strike at the heart of the difficulty. They are precisely those which the hospitals find it hardest to face, because they alter fundamentally their disciplinary and economic relations with the nursing staff. If the best types of woman in the country, however, are unwilling to submit themselves to the traditional conditions, the conditions must give way. We not only want the best nurses: we can have them—but on contemporary terms.

Annotations

INTRACAPSULAR FRACTURES

NEARLY 40 years ago Royal Whitman of New York began to teach that fractures of the neck of the femur—which for many generations had been regarded by surgeons as a lost cause—could be reduced by manipulation, and, if fixed in a plaster spica with the hip abducted and extended, could be expected to unite soundly. In due course Whitman was able to demonstrate to unbelievers that the abduction plaster could be used with safety in old and frail patients. This was a notable landmark in the evolution of modern fracture treatment, and the Whitman procedure soon became the accepted routine in surgical clinics throughout the world. As experience increased, it became evident that there were many disappointments and failures still to be faced; even in experienced hands, and in recent years, the treatment of this type of fracture carried with it a mortality of 12–15%, and bony union was observed in not more than 50% of the cases. In 1907 Pierre Delbet of Paris had devised an operation in which the fracture line was transfixed in the long axis of the femoral neck by a screw or nail, the whole procedure being carried out under X-ray control. The Delbet technique attracted few followers, and it was not until 1931, when Smith-Petersen [1] of Boston reported the first series of cases in which he had used his now famous triflanged nail, that interest was reawakened in the problem of internal fixation of the fracture. Smith-Petersen's mode of attack was to reduce the fracture after exposing the fragments through an anterior arthrotomy, and to insert the nail under direct visual control. The disadvantages and risks of a wide exposure of the hip-joint in the older patients led to a revival of the Delbet principle of nailing under X-ray control. Since 1934 this principle has gained almost universal approval, and the triflanged nail provided with a central canaliculus to allow its insertion over a guide, has been used in the majority of surgical clinics. In the perfection of the technique of extra-articular nailing, Sven Johansson of Gothenberg [2] and Thomas King of Melbourne,[3] amongst others, have played a notable part.

In the United States, multiple wires of the Kirschner type have found favour as an alternative means of internal fixation, and more recently the advantages of a special screw so constructed as to exert a binding or impaction force on the fragments, were stressed by the late Vittorio Putti [4] in one of the last contributions made by this great intellectual leader of orthopædic surgery. Some of the earlier reports of the results of extra-articular nailing, which were based on comparatively short periods of observation, created the impression that the problem of the intracapsular fracture of the femoral neck was now finally solved. But evidence which is now becoming available shows that this optimistic view is unjustified. A valuable report of a commission set up by the American Academy of Orthopedic Surgeons [5] has been recently issued, the commission has analysed the late results of pinning in 247 subcapital and transcervical fractures, which—out of 923 documented cases—were accepted as fulfilling the following requirements: the fractures were recent and showed definite displacement; pre-reduction and post-reduction radiograms were available for scrutiny; and radiograms of the fracture taken one year later accompanied the clinical notes. In these 247 cases the fracture was secured by a triflanged nail in 144; by multiple wires (pins or spikes) in 83; and by miscellaneous means (screws, grafts) in 14. The commission found that bony union was obtained in 169 cases (70·1%), with a slightly higher figure in fractures treated by the triflanged nail as compared with those fixed by multiple wires. Arthritic changes of varying degree developed in a quarter of the cases in which bony union occurred; the most severe types of arthritis, which were characterised by aseptic necrosis and disintegration of the femoral head, were seen in cases examined 18 months and 2 years from the time of the operation. In the non-union group (30%) there was a higher incidence of failures in fractures imperfectly reduced.

The 923 cases (of which 682 were rejected in the survey of late results) yielded valuable collateral information. The mortality was 11·6%—not very different from the figures for the Whitman method. Failure to maintain fixation of the fragments, owing to breaking of the nail or shifting of the nail, was reported in 11% of the triflanged nail cases, in 21% of the multiple wire cases, and in 20% of the cases fixed by miscellaneous means. It was noted that a shifting nail tended to be extruded, whereas multiple wires tended to enter the joint cavity. Despite these drawbacks the commission were in no doubt that in the hands of expert surgeons the modern method of internal fixation had improved the results of the treatment of intracapsular fractures of the femoral neck.

1. Smith-Petersen, M. N., Cave, E. F. and Vangorder, G. W. *Arch. Surg. Chicago*, 1931, **23**, 715.
2. Operative Treatment of Collum Femoris Fractures, Copenhagen, 1934.
3. *Med. J. Aust.* 1935, **2**, 521.
4. Cura Operatione delle Fratture del Colle del Femore, Bologna, 1940.
5. *J. Bone Jt Surg.* 1941, **23**.

They concluded with a note of warning—that many disappointments and failures were bound to occur if the method was used by inexperienced operators.

There is as yet no comparable series of documented cases treated in Great Britain, but a recent analysis of the late results of 75 consecutive intracapsular fractures treated in the Bristol fracture clinics[6] bears out the cautious findings of the American observers. In the Bristol cases, which were all reviewed after one year or longer, bony union (demonstrable by radiography) was obtained in 58·7%; necrosis of the femoral head developed in 14·7% (it was commoner in the younger patients); the operation failed for technical reasons in 8%; and the mortality (within three months) was 5·3%. Clearly the intracapsular fracture of the neck of the femur still presents a formidable problem.

A BOOK ON BURNS

THE flash of the exploding bomb, fire in the air, fire on the ship, the burning house, all the associates of war make burns one of the most important of war injuries. Before the war we accepted the tannic-acid treatment of burns rather as the totalitarian states accept the dictates of the dictators—en masse. Every wrinkle, every finger, every eye, every degree of burn required only this one treatment. The pace of war quickened, the burns were severe and the misuse and maluse of tannic acid was soon to lead to some tragedies. Then the pendulum swung to the opposite extreme and tannic acid came to have more horrors than the devil himself. Saline baths, bags, oils, ointments, a profusion of old treatments were revived or suggested. The battle of burns was on, and the practitioner has stood and stared and looked up at it, pardonably a little bewildered. The short treatise of a hundred pages by Mr. A. B. Wallace[7] brings with it an ebullition of cooler reason. "Up to the present and generally speaking the employment of one of the tanning agents is undoubtedly the method of choice in the treatment of burns," he says. But he makes it clear that he does not like tannic acid for the hands, and for what are now called deep or third-degree burns. On the face he has had good results with tanning and has not been troubled by corneal ulceration. He describes in detail the various methods that may be employed, especially saline baths, and comments that there are particularly promising hopes for the treatment of third-degree burns with Euglamide—a sulphonamide, cod-liver oil, glycerin dressing introduced by the Edinburgh school. For first-aid treatment he would have no local substance applied and the patient merely brought to hospital as soon as possible. The whole book is packed with practical suggestions. He gives charts how to estimate the extent of the surface lesion, details of how to maintain the water balance, the amount of serum required, and even the details of serum preparation. Particularly valuable are his constant references to the relative amounts required in the treatment of burns of infants and children. His suggestion of taking half-hourly rectal temperatures and blood-pressure records is not always feasible in time of war, and frequent recordings of blood-pressure are often distressing for the patient with swollen burnt arms. His illustrations of how to set out trolleys will be of particular value in organising burns units, whose importance he urges strongly. Some of the other drawings showing the cleaning of the patient are not however very instructive, and their space might have served for greater encouragement of skin-grafting and a fuller description of its technique. Nor is it essential, especially in the light of the E.M.S. memorandum on the treatment of burns[8] in which soap and water are recommended; to insist on the use of saline only for the cleaning of the burn. But he sets out clearly the recent advances of this war—even to the air filter for the drier, since the danger of disseminating dust-borne bacteria has been recognised.

6. Eyre-Brook, A. L. and Pridie, K. H. *Brit. J. Surg.* 1941, **29**, 113.
7. The Treatment of Burns. London: Humphrey Milford. Pp. 106. 5*s*.
8. See *Lancet*, March 29, 1941, p. 425.

BACTERIOLOGICAL DIAGNOSIS OF TUBERCULOSIS

DEMONSTRATION of the causative organism in material from an affected patient is, with minor qualifications, the most reliable method for the diagnosis of any infection. Tuberculosis is no exception, but the bacteriological diagnosis of tuberculous infection is far from satisfactory, and attempts to demonstrate the organism are often made in too perfunctory a manner. In the case of pulmonary tuberculosis, even when a diagnosis of parenchymatous infection is made by other than bacteriological means, it may be all-important both for the patient and the community to know if tubercle bacilli are being expectorated. The methods available are direct microscopic examination of the sputum before and after concentration, culture on suitable media, and guineapig inoculation; whenever the diagnosis is in doubt all three methods should be used. In the direct microscopic examination of sputum there are certain essentials which must never be omitted. Among them are the need for examining several daily specimens of the morning spit, and in the laboratory, scrupulous cleanliness of glass-ware, preparation of the smear from a purulent speck, diligent microscopic search, and precautions against saprophytic acid-fast bacilli from cold-water taps, corks and the like. The value of microscopic examination of the concentrated deposit after treatment of the sputum with antiformin or normal soda is not generally appreciated—for example, in one recent series, out of 112 specimens microscopically negative on direct examination, 33 were positive on culture, and of these the smears of 16 concentrated deposits were microscopically positive, so that an immediate report could be given.

Where sputum is not available, examination of gastric contents or of faeces is recommended, particularly in children who tend to swallow their secretions. An alternative, and easier, procedure is the use of the laryngeal swab, and Nassau[1] has lately shown how the technique can be used culturally for the isolation of tubercle bacilli from apparently sputum-free patients; the results were particularly good in women, in those undergoing collapse therapy, and in the diagnosis of early infiltrative lung lesions. The swab, moistened in water, is passed into the larynx with or without the aid of a mirror, and the patient is asked to cough. On receipt at the laboratory the swab is placed for 5 minutes in 10% sulphuric acid, transferred to 2% sodium hydroxide for 5–8 minutes and then rubbed over the culture medium. In two groups of 166 and 107 patients, who were originally sputum-free or had ceased to expectorate, 37·9 and 54·2% respectively gave positive cultures from the laryngeal swab.

The satisfying results obtained from culturing suspected tuberculous material in screw-cap bottles on the newer media—Löwenstein-Jensen,[2] Petragnani,[3] Jamieson's[4] medium, and now a bean-egg medium[5]—are gradually becoming more widely known, but the best method for concentration of sputum or other contaminated material, the amount of inoculum, the number of culture tubes to be inoculated, and the optimum gaseous and pH environment are points about which there is as yet no finality. Failures occur inexplicably, and in any large series in which the results obtained by smear, culture and guineapig inoculation are compared, no one method gives 100% of positives. In a recent analysis of a miscellaneous

1. Nassau, E. *Proc. R. Soc. Med.* 1941, **34**, 397.
2. See Mackie, T. J. and McCartney, J. E. Handbook of Practical Bacteriology, Edinburgh, 1938, p. 123.
3. See Jamieson, S. R. *J. Path. Bact.* 1936, **42**, 435.
4. *Ibid*, 1938, **47**, 353.
5. King, E. S. and Lucas, M. *J. infect. Dis.* 1941, **67**, 216.

collection of sputa, urines, pus, pleural and cerebrospinal fluids from tuberculous cases (total positive, 321) Whitehead [6] had 139 specimens positive on culture which were negative microscopically, but he also had 27 positive smears with corresponding negative culture. Again, 31 specimens were positive on culture but negative in the guineapig (9 animals died prematurely), while 23 specimens, negative on culture, were positive in the guineapig. Obviously there are factors concerned in the recovery of the tubercle bacillus from infected material which still need elucidation.

ABSORPTION OF IMPLANTED HORMONE TABLETS

THE administration of hormones by the subcutaneous implantation of compressed tablets [7] may now be said to have passed the experimental stage and to have proved its value, especially when a long, steady dosage is required. The technique has received considerable clinical attention, and minor difficulties such as preparation and sterilisation have been largely overcome. It is also generally agreed that, after the implantation of tablets into a pocket of the subcutaneous tissue and closure with a stitch, the skin heals normally and no local disturbance results. A tight capsule composed of connective tissue forms around the tablet. It varies in vascularity, and is of doubtful influence on the rate of absorption. Menopausal or postmenopausal women with symptoms controllable by œstrogens, eunuchs or eunuchoids, and cases of Addison's disease are typical examples of subjects in which the implantation of tablets gives continued therapy, without frequent injections, with substances of small or doubtful activity by mouth. In these cases, the longer a single implantation is effective the better for the patient; hence it is necessary to know the level of dosage we can expect a tablet or nest of tablets to give after it has been in situ for some time. Relatively few observations of the rate at which absorption continues as the tablet diminishes in size have been made in the human subject, but in one of the most detailed reports, Geist and others [8] conclude that tablets of œstradiol, implanted in women, become so isolated by the progressive formation of a thick capsule of connective tissue that after a period of about 3 months absorption almost ceases. They prefer to use loose crystals for clinical implantations, for these produce less encapsulation than tablets. On the other hand, Thorn and Firor [9] have studied the absorption-rates of tablets of desoxycorticosterone acetate in man, and their results show that the absorption from a tablet left in situ for nearly 250 days continues at much the same rate as that from tablets implanted for shorter periods. They comment on the regularity of the rate of absorption, and conclude that a single implantation of tablets of the hormone should supply enough material to last 9–12 months.

This problem of the rate of absorption and its maintenance is more easily investigated with animal material. Emmens [10] has implanted uniformly compressed disc-shaped tablets, of testosterone, œstradiol and diethylstilbœstrol, and a large series of their mono- or di-esters into male rats. The tablets were as uniform in weight and size as could be obtained, and were removed at intervals of up to 85 days, weighed and reimplanted in a fresh site. The variation in the rate of absorption from tablet to tablet of the same substance was small, especially for the steroids. As found by Thorn and Firor with desoxycorticosterone, the rates of absorption tended not to fall but to remain at about the initial level even when a considerable percentage of the tablet had been absorbed. Emmens concludes that a practically constant dose-level may be maintained throughout the greater part of the life of such a tablet, as long as the danger of sudden crumbling is avoided by care in manufacture. Esterification of the substance reduces the rate of absorption, and it should be easy, by choosing a suitable ester and using several tablets for implantation, to administer a steady adequate dosage for very long periods by a single operation. A similar investigation was carried out by Forbes,[11] who used cylindrical tablets of uniform compression. Forbes excised tablets from his rats at various intervals after implantation, and did not reimplant them. Unfortunately, he used tablets of such a shape and weight (6–10 mg.) that 90% absorption took only 88 days with the most slowly absorbed substance, progesterone, so that the effect of prolonged encapsulation was not observable. However, he says that in cases where a tablet is surrounded by a thicker capsule than usual the rate of absorption tends to differ somewhat from the others—it appears from his figures to be most often *greater* than usual. These data show conclusively that encapsulation in animals does not prevent absorption, which continued at a steady rate in Forbes's experiments until 90% of the tablet was absorbed, except with progesterone, which showed a decrease in the absorption-rate as time went on.

Fears that the long-implanted tablet loses its usefulness, or even that its output decreases as much as theory might predict, thus seem to be ill-founded. The results of Geist and his colleagues with œstradiol cannot be ignored, but need confirming before they can be accepted as of general application. Since these workers used physiological critera by which to measure the output of the tablets, it is not impossible that they were working near the threshold of response, and that a slight decrease in absorption was erroneously interpreted as a cessation or near-cessation.

PLANNING FOR MENTAL HEALTH

IN 1938 the Council of the British Medical Association appointed a committee, under the chairmanship of Dr. R. G. Gordon, to inquire into and report upon the provision for dealing with mental health in this country, with special reference to the psychoneuroses and allied disorders. The work of the committee, apart from consideration of the report, was completed before the war broke out; the report [12] has now appeared and gives a useful survey of our facilities for mental treatment up to that time, with a model scheme for an organised mental health service. The committee emphasise the essential unity of mental and physical illness; they cannot be divorced from each other and in all diseases both the psychic and somatic components must be taken into account. They quote Dunbar, Wolfe and co-workers who found the psychic factor important for the illness in some 80% of hospital admissions; and on that and other evidence conclude that in any group of sick persons something like 30% will be found to be suffering from conditions in which it is helpful to have psychiatric advice. The committee agree that no clear distinction can be made between the psychoneuroses and the psychoses, and that the conditions diagnosed can be ranged in such a way that the actually or potentially psychotic form one end of a scale at the other end of which are those psychoneurotics who are no more liable to develop a psychosis than anyone else. The size of the mental health problem is manifest in their frank statement that it is at present impossible to provide treatment for all those demanding or requiring it; and they repeatedly urge the need for more doctors trained in psychological medicine, and for greater attention to psychiatric training in the medical curriculum. The inpatient provision for chronic psychotic patients, they think, is reasonably efficient and the provision for

6. Whitehead, H. G. *Amer. Rev. Tubere.* 1940, **42**, 795.
7. Deanesly, R. and Parkes, A. S. *Proc. R. Soc. Med.* 1937, **124**, 279.
8. Geist, S. M., Walter, R. I. and Salmon, U. J. 1940, *Proc. Soc. exp. Biol. N.Y.* 1940, **43**, 712.
9. Thorn, G. W. and Firor, W. M. *J. Amer. med. Ass.* 1940, **114**, 2517.
10. Emmens, C. W. *Endocrinology*, 1941, **28**, 633.
11. Forbes, T. R. *Ibid*, **29**, 70.
12. From B.M.A. House, Tavistock Square, W.C.1. 6d.

voluntary and temporary patients in some areas is good; but they recognise an urgent need for special accommodation for the treatment of those acutely ill patients who have a prospect of recovery. These, they wisely hold, should be treated in separate units from those provided for chronic patients. Moreover, they point out that there is at present no special provision for chronic neurotic patients, who constitute a serious social problem. Among many valuable recommendations they suggest that some uniform system of follow-up and assessment of results should be adopted by the larger institutions undertaking treatment. Certainly we have much to learn about the value of psychotherapy, and uniform records would in a few years make a large body of information accessible.

FATAL STINGS

SUDDEN deaths after a sting by bee or wasp are rare but not unheard of. The two examples recorded by Dr. Dyke on another page can be supplemented by another which was reported in the daily press last week in East London. A married woman of 43 had kept bees for two years and had often been stung without more than the usual unpleasantness. In the middle of July, however, she was stung on the neck and ten minutes later her chest felt tight and she found difficulty in breathing either in or out. She looked blue and felt faint, but in half an hour was well again. Six weeks later she was attending to her bees, wearing gauntlets and trousers, with a veil over her face, when she was stung four times in quick succession, on the left ankle, on the dorsum of her right foot and twice on her right calf. She took little notice for seven or eight minutes, when she again felt tight in the chest, and hurried anxiously indoors to lie down. After another two or three minutes she was deeply cyanosed, her chest seemed fixed and she was frothing at the mouth. She died about twelve minutes after the stings. No treatment was given. All the stings looked alike, with a central weal 2 mm. across and an outer ring of erythema 8–10 mm. across; there was no rash elsewhere. At the autopsy Dr. Keith Simpson found no pre-existing disease. The body was deeply cyanosed and there was slight œdema of the lungs, filling the terminal airways and producing some ballooning. The cause of death was "allergic shock due to bee-stings." The woman had twin daughters, aged 15, and a month ago one of these developed sudden pain in the upper abdomen with generalised itching and widespread urticaria within five minutes of being stung by a bee. Her sister has shown no unusual reaction to stings. The coroner suggested that both of them should avoid bees in future.

These people clearly die from the violent tetanic contraction of the bronchial muscles such as is seen in anaphylactic shock, but why they do so is not so clear. Bee venom is a complicated mixture,[1] but the more reliable recent work points to the main toxic fraction being a dialysable protein of low molecular weight. Wasp venom is probably much the same, though there is little cross immunity between the two. Hypersensitivity seems to be the likely explanation, but this cannot be the whole one, for bee-keepers have noted severe general reactions at one time and not a day or two later. Massive dosage may play a part, but deaths have followed single as well as multiple stings. Dyke favours Roch's view that the fatal sting happens to pierce a vein, and Ryle[2] has supported this view in reporting a severe general reaction after a sting which made no mark. In the latest case, too, Simpson found a minute puncture in a vein underlying one of the stings in the calf. Dyke points out that in all the recorded cases the patient has died within half an hour of the sting, but death is not immediate, and there would be time to give an injection of adrenaline if this was handy. The cautious bee-keeper might keep a tube-type syringe containing adrenaline on the mantelpiece.

1. Thompson, F. *Lancet*, 1933, **2**, 446.
2. Ryle, J. A. *Ibid*, 1932, **1**, 642.

A NEW ANTIMALARIAL DRUG

So far, all compounds which have a definite action against malaria of man have also proved effective against malaria of birds, although not always to the same degree. The converse, unfortunately, does not hold true, so that tests with bird malaria, while they afford a convenient, and indeed essential, method for the preliminary evaluation of the antimalarial properties of new synthetic compounds, serve principally as a means of selecting those which are worthy of further tests on human parasites, and for eliminating those which have no antimalarial action. Testing by means of bird malaria (especially *Plasmodium relictum* in canaries) has been in progress on a large scale in Germany, Great Britain, France and Russia for the past 15–20 years and all the new synthetic compounds with proved antimalarial action in human malaria—Plasmochin, Atebrin, Fourneau 710, Plasmocide and so on—have been discovered in this way. Work on similar lines has been going on in America, and now Hegner and his co-workers[1] report the discovery of another effective compound in the derivative of quinine known as hydroxyethylapocupreine, which has been used for several years in the treatment of pneumonia.[2] They claim that this drug is much less toxic than quinine (it produced no toxic manifestations in the pneumonia cases), and about equally effective against the parasites of bird malaria. They made tests with three species of bird malaria—*P. lophuræ* in young Pekin ducks, *P. relictum* in pigeons, and *P. cathemerium* in canaries. The new compound showed antimalarial action, more or less similar to that of quinine hydrochloride, against all three parasites. No precise figures are given for the maximum tolerated and minimum effective doses with respect to the different parasites, but it appears from the experiments on *P. cathemerium* that the therapeutic index (minimum effective dose: maximum tolerated dose) is about the same as that of quinine, which is 1 : 4. The lower toxicity of the new drug would be valuable if this increased its therapeutic index, but if the minimum effective dose is correspondingly higher than that of quinine more of it will have to be given to achieve a similar antimalarial effect, and there will be little practical advantage unless it is much cheaper than quinine.

In birds the new compound proved equally effective when administered by mouth, intravenously, intraperitoneally and intramuscularly; it remains to be seen what its action will be in man.

1. Hegner, R., West, E., Ray, M. and Dobler, M. *Amer. J. Hyg.* 1941, **33**, 101.
2. See *Lancet*, 1941, **1**, 670.

AMORY PRIZE.—The first award of this septennial prize has been made by the American Academy of Arts and Sciences to Dr. Joseph F. McCarthy, professor of urology at the New York Polyclinic, Mr. Carl R. Moore, Ph.D., professor of zoology in the University of Chicago, Dr. Hugh H. Young, professor of urology in the Johns Hopkins University, and a European scientist whose name is temporarily withheld as he lives in a country dominated by Nazi Germany. The prize, which is the income from a fund established by the late Francis Amory in 1912, amounts to nearly $16,000 and it will be equally divided between the four scientists. It was offered for contributions to the treatment and cure of diseases of the genito-urinary system. Dr. McCarthy has developed instrumental procedures for the diagnosis and treatment by way of the urethra, without external excision, of diseases of the bladder and prostate. Dr. Moore has investigated the physiology of the male reproductive tract, especially as it is influenced by the hormonal secretions of the male sex gland. Dr. Young has devised an operation of total prostatectomy by the perineal approach for the relief of obstruction of the bladder caused by cancer of the prostate gland.

Special Articles

THE CHANGING FACE OF MEDICINE IN NEW ZEALAND

LAST year New Zealand celebrated the centenary of its separate existence as a colony, later a dominion, of the British Empire. From a handful in 1840 its population has grown to somewhere near two million, 95% of whom are of British stock. Its temperate climate is milder than that of Britain, and its landscape more varied, but it has no great mineral wealth. So its economy is based on farming, and its farmers grow the same crops and the same animals as are raised by the farmers of this country. It is not surprising, therefore, that in its domestic life and its social and political institutions it is closer to the tradition of this country than is any other part of the empire. This similarity of tradition, together with the small scale and relative simplicity of the New Zealand scene, make the social problems of that country peculiarly interesting to the students of social problems in this. New Zealand's problems are test-tube versions of ours, and moreover the New Zealand people are enterprising enough to make experiments with the contents of their test-tubes. In the 'nineties they attracted the world's political interest by their liberal legislation—the enfranchisement of women, for example, and the Compulsory Arbitration Act. In 1935 a Labour government came into power, and, taking control at the outset of the country's finances, has embarked on a programme of social legislation that, in conception at least, is bold, broadminded and progressive. One of its measures is a Social Security Act, which includes a plan to nationalise the medical profession. This has met with intense opposition from the profession, and has not yet been carried into effect.

The background and the progress of this experiment deserve study outside New Zealand. They are described in a small book, "Medicine and Health in New Zealand,"[1] by Douglas Robb, an Auckland surgeon in his early forties. He sees the problem as one part of the major task of modern civilisation, which is the adaptation of social institutions to the changed conditions of man's life brought about by applied science. Social institutions are slow growers, and their adaptation lags, but it must inevitably come. To resist it is as futile as Canute. To study it, to influence its speed and form, is the only course open to an intelligent mind. Robb describes the public hospitals of New Zealand, financed partly from rates and partly from the government, each controlled by a lay board elected locally in a political atmosphere. He allows that they do a great deal of good work, but he finds that they fall short of what they should do—namely, dispense to the people of the country the best advice and treatment that modern scientific medicine can offer, and dispense it as soon as it is available. They fall short because there are many of them and they do not work in coöperation. Expensive equipment is not concentrated and made available in large centres, and there kept up to date, but small hospitals attempt more than they can properly accomplish or maintain.

The same is true of personnel. Technical specialism is not sufficiently advanced—in one of the largest hospitals, for instance, gynæcology is still part of the field of the general surgeon. The country's chest surgery and brain surgery are not in the hands of a few well-trained men, who alone could do them really well. The reason for this is that the organisation of hospital staffs (who are still honorary although the hospitals are state-financed) is determined not by the fact that hospital patients need treatment but by the fact that members of the staff need to earn their living in private practice. The two needs do not run parallel, and when in addition appointments are liable to be made and unmade capriciously by a politically minded lay board without professional advice, the standard of work done must be less than the best. In general practice the same conflict occurs. What the practitioner mostly does, and what he becomes most interested in, is what patients can and will pay for, not primarily what patients need. He cannot help this attitude, for he must earn his bread. He cannot help preferring the removal of one child's acutely inflamed appendix to the patient investigation of the reasons for another child's wetting the bed. It is not his individual fault that the economic rules under which he works do not allow him to do the best that medicine can do for every patient. The fact that he is in competitive private practice is the chief reason why he contributes little to preventive medicine, does nothing in the nature of research, and does not even succeed in fully developing that aspect of the family doctor's relation to his patients which might be called pastoral care.

By discussion of this theme, with variations, Robb makes it clear that reorganisation of New Zealand hospitals should be attempted along what he calls "functional" lines. The prime considerations are the patients' needs and how the resources of modern medicine may most efficiently be brought to meet them. A locally elected hospital board in a small district cannot weigh these; more coördination of districts, with a measure of central control, is needed, and that central control should include non-political voices, many of them medical. Staff appointments should be made with those prime considerations in view, and by bodies on which the best disinterested professional opinion is well represented. Posts of the registrar type should be instituted. Staffs should be no longer honorary, but reasonably paid and pensioned. He does not discuss in detail whether they should be full-time or part-time. This problem is bound up with that of the future of general practice. The Social Security Act of 1938 promised a free maternity and general practitioner service to the whole population, but the government has not yet succeeded in introducing it. The B.M.A. in New Zealand had already formulated a scheme based on the insurance principle, and applicable by an income limit to 70–80% of the population. The government insisted, however, on universal application, and rejected the B.M.A. scheme. It began discussions with the B.M.A. on how a universal scheme might be worked, whether on a purely salaried basis, on a capitation basis, or by paying the doctor so much per attendance on every patient coming to him. It succeeded in getting an agreed scheme for a maternity service, which is now operating, on the attendance basis, but on the general practitioner service the discussions reached a deadlock, which looks like lasting until the return of medical men from overseas service at the end of the war. In February last the government actually brought into force a general practitioner service on a capitation basis (15*s*. per patient plus mileage), but the president of the B.M.A. announced the non-coöperation of members and since then only a handful of doctors have signed contracts. Last week however the government amended the Social Security Act by changing the doctor's payment from a capitation fee of 15*s*. to a consultation fee of 5*s*. (6*s*. 6*d*. a home visit), plus mileage as before.

Robb holds that reorganisation of hospitals and specialist services is more urgently needed than that of the general practitioner's conditions of work. He favours the idea of the American community hospital, which serves all members of its community, and eliminates the ill-equipped uneconomic small private hospital. He discusses the bearing of possible reorganisation on medical education. He describes the widely varying reactions of New Zealand medical men to reconstructive suggestions. The younger ones, who in larger proportion than their seniors have had post-graduate experience abroad, find it more difficult than their seniors to establish themselves in practice and earn a livelihood; they see the deficiencies, and itch to remedy them more or less radically. The older ones, as a group, are strongly conservative. From their social origins, Robb thinks, from the narrow and technical nature of their "university" education, doctors as a class tend to grow conservative; their detailed and absorbing daily work, their close dependance, when success comes in practice, on local conditions and relationships, make them more conservative as they grow older, more satisfied with the status quo. There is considerable "feeling" between these age-groups, which is unfortunate and unworthy, and hinders progress without directing it. Robb concludes with an appeal for an informed and competent survey of the situation of medicine and health in New Zealand, adding gently that "amongst the surveyors there should be at least some whose interest

1. New Zealand: Whitcombe and Tombs, pp. 146, 8*s*. 6*d*.

lies in the future rather than in the past." From the survey an acceptable plan should emerge, for the "total problem in New Zealand is a bagatelle compared with that in Britain."

Such a survey would certainly be of great interest to the various bodies in this country in whom the yeast of "planning" is at work, and they would welcome still more warmly a serious attempt, made by the government and the profession in New Zealand, to realise a coöperative scheme of medical services in which patients would be better served than ever, and doctors freed from the constraints of economic competition, yet not fettered by those of bureaucratic organisation.

MEDICINE AND THE LAW

A Masseur's Negligence

DAMAGES for negligence were awarded lately in the Plymouth county court against George Carter who, describing himself as a masseur and medical electrician, had undertaken to treat Miss Winifred Snell, a woman of 32, for disseminated sclerosis. The patient's mother said that the defendant had been told of Miss Snell's condition and had agreed to carry out four treatments a week at 7*s.* 6*d.* per treatment. He had told her that he was treating somebody else for the same complaint. Two treatments were given on successive days; the patient's back was massaged with oil and ray lamps were used. Soon after the second treatment, the skin began to come off the back, which was severely burned. The burns became gangrenous and, after suffering great pain, the patient died of toxæmia. Dr. S. Noy Scott gave evidence that ray treatment was inadvisable and useless; the disease made the skin insensitive to heat. Anyone with medical knowledge, he said, would realise the danger of ray treatment in such a case. Carter, conducting his own defence, denied that he had been told the nature of the patient's illness; he attributed the wounds to chafing set up by incontinence. Answering the judge, he stated that he had no certificate of competence, but he had long experience, having practised for twelve years. He had spent three years in the Victor Institute in Australia, an institution conducted by an American; he left it when the American died. He considered that he knew when ray treatment would be dangerous; he had books which told him when it should or should not be given. Before becoming a masseur, he had been a merchant seaman. Asked by the court if it was his practice to take a patient without proper knowledge of the medical attendant's diagnosis, he replied that patients were usually recommended to him by doctors.

His Honour Judge Scobell Armstrong said he must find Carter negligent in law; he awarded Mrs. Snell £59 1*s.* 6*d.* damages. He went on to offer the court's "full sympathy" to the defendant, regarding him as a person entirely competent to perform work under a doctor's recommendations in all normal cases; unfortunately this had been "a very unusual case."

If comment can be added without disrespect to a careful and courteous tribunal, the decision and its rider exhibit the national compromise between two views of unqualified practice. One view resents any control of such practice, because unsupervised masseurs like the defendant may possess, or may at any moment discover, some therapeutic secret overlooked by orthodox medicine and because there is much more scientific truth in the world about us than is dreamt of in the registered medical practitioner's philosophy. The other view is that it is unfair to the public to leave electrical or radiological treatment so utterly uncontrolled that an unqualified man can cause fatal burns to a patient suffering from disseminated sclerosis. On this view the sympathy is even more needed by the public than by the unqualified man. Accordingly many progressive municipalities (and at least one county council) have successfully promoted legislation authorising them to license and supervise establishments for massage and special treatment such as electric or radiant heat therapy. Unlicensed practice is prohibited, and licences can be refused where applicants do not possess "such technical qualifications as may be reasonably necessary." There is no need to wrangle over complaints of professional monopoly; the defendant at Plymouth had all the freedom he could desire. If the public interest alone be regarded, would it, or would it not, be "reasonably necessary" that an unqualified practitioner who takes money for administering ray treatment should possess and apply the knowledge that there may be "very unusual cases" where his ray lamps will do more harm than good?

Volition in Matrimonial Desertion

Desertion, for the purposes of our divorce law, must be a deliberate and intended act. A patient in a mental hospital, if incapable of "the quality of volition required to produce legal consequences," cannot be guilty of desertion. This point was fully examined two years ago in Williams *v.* Williams. Each case, however, turns upon its own facts; the mere suggestion of mental ill health will not establish incapacity of intention. Recently in Monckton *v.* Monckton the facts were as follows. In 1937 the wife ordered her husband out of her house in which they lived and had told him to remove all his possessions. Two years later she went into a mental hospital as a temporary patient. After a year as temporary patient, she was re-graded as a voluntary patient on Dec. 20, 1939; she was discharged on Jan. 22, 1940. While in hospital she wrote affectionate letters to her husband which held out some prospect of reconciliation. But on Jan. 9, 1940, when he went to France with his regiment, there was a quarrel and she declared that she never wanted to see him again. She refused to change this attitude when, on his return from France, he appealed to her to join him. He then petitioned for divorce on the ground of her desertion.

Under the Herbert Act he had to show that she had deserted him without cause for at least three years immediately preceding his petition. Had her mental condition been such that she could not decide for herself whether she should or should not enter the hospital? If so, the husband would be unable to prove her intention to desert and her persistence in that intention for the necessary three-year period. Mr. Justice Henn Collins said that, on the facts before him, the court could not infer any such degree of insanity or lack of the "quality of volition." He granted a decree *nisi*.

Alleged Delay in Hospital Treatment

Hospital authorities are probably well aware that a few words hurriedly spoken at the admission of a patient can create the impression of some defect of care and sympathy. At a recent Manchester inquest upon a little girl who died three hours after being taken to the Crumpsall Hospital a constable and a police ambulance driver gave evidence of statements by the casualty ward sister that the child should not have been brought there but should have been taken to another hospital specially prepared to receive children. It was also alleged that an injection of morphia was not given till half an hour after the child, suffering from severe burns, had been admitted, and that it was a quarter of an hour before the policeman's cape in which she was wrapped was removed and warm blankets were applied. The ward sister denied saying that children were not admitted at the Crumpsall Hospital; there was no delay in giving the injection; the child was placed in warm blankets and the doctor sent for within five minutes of arrival. She denied that, when the police officers asked her to give first-aid, she replied that it was not a first-aid post. There was dispute about the entries and times recorded in the hospital books. Two medical officers at the hospital testified that the child received the best and quickest possible attention from the staff and that the hospital regulations had been faithfully carried out.

The coroner said it appeared to be a rule of the hospital that normally no child under 16 should be admitted as an inpatient; but these instructions included the order that, irrespective of age, any patient should be admitted if his or her condition warranted it and that the doctor who saw the patient should judge his or her condition. He was himself satisfied that the dominant idea in the ward sister's mind was that the child, being under 16, should be taken to the Booth Hall Hospital. In the result the child suffered some unnecessary pain and suffering. Life might not have been saved or even prolonged, but proper treatment would have made her remaining hours a little more comfortable. He hoped that in future the administrators of the hospital and the medical superintendent himself would make sure that

all orders issued to the staff were thoroughly understood and obeyed. He recorded a verdict of death by misadventure. He had found, he said, several contradictions in the evidence and, as an old member of the bar with many years' experience, claimed to judge from the demeanour of a witness as well as from the testimony given. He had, by the way, asked the two medical officers who gave evidence to leave the court while the ward sister was in the witness-box. This forensic precaution against possible conspiracy and perjury is not universally taken in the case of professional witnesses.

AN ACCEPTABLE STATE MEDICAL SERVICE

AN open meeting of North London general practitioners from the City of London and the boroughs of Hackney, Finsbury, Stoke Newington, Shoreditch and Bethnal Green, was called by the Practitioners Coördinating Committee on Sept. 2, at Islington, to discuss a state medical service.

Dr. M. F. MOLONEY, who was in the chair, mentioned the dissatisfaction which many doctors felt at the lack of representatives of general practitioners on the B.M.A. Medical Planning Commission. In medicine today, he said, the doctor often worked alone in his own surgery with inadequate equipment for the diagnosis, investigation and treatment of disease. The patient got the best treatment his doctor could give him with the means at his disposal, but not the best that could be had. Nor was the doctor's position becoming any easier. National Health Insurance had been extended to include those with incomes of £420. Public-health clinics, though progressive and valuable, were encroaching on the territory of the general practitioner. He urged that general practitioners should see that those representing their interests on the planning commission or other bodies really did advocate their policy, and that they were not mere yes-men. Those doctors who were not members of organisations should talk to their friends and colleagues until an informed body of thought was available.

Dr. B. HYNES thought that, to ensure that all general practitioners were properly utilised in a state scheme, three plans were needed: an urban, a suburban and a rural plan. Discussing the needs of an urban area he suggested that a large borough like Islington would be divided into centres serving 10,000–11,000 people. There would be a unit or clinic housed in a two-story building, placed where it would be easily accessible to the residents of the neighbourhood. The ground floor would contain the dispensary, surgery, nurses' side-room, waiting-hall and five small consulting-rooms with examination-rooms opening from each. Clerical work, apart from medical note-taking, would be done by a secretary in the office by the front door. Upstairs there would be sleeping accommodation for two doctors, living quarters for the nurse, two small observation wards, a large sitting-room (also to be used for medical meetings and conferences), a pathology laboratory for simple tests and investigations, and a small X-ray plant by which the presence of fractures could be decided without loss of time. The personnel would consist of 10 doctors, working on a rota, 4 in daily session for surgeries and visiting, 2 on night duty (one to take calls and the other to attend emergency admissions) and 2 off duty. There would be a day and a night nurse, possibly with a relief, a combined laboratory and X-ray attendant, a clerk and a porter. Salaries should be appropriate to the posts, and the doctors should get three or four weeks holiday on pay and additional time off to attend periodical refresher courses. There would be provision for sick pay, and for a pension on retirement.

Dr. W. W. FOX remarked that he had not been in favour of a state medical service in the first place, because he felt the practitioner could do better for himself than the state would do for him; but he had come to the conclusion that unless general practitioners made their wishes known a state service would be introduced based on an extension of the principle of the capitation fee. Doctors had asked for an increase of the capitation fee in vain. Lately the £420 income group, from whom general practitioners until now had derived an appreciable part of their income, had been brought under national health insurance, with an increase of a mere 9*d*. on the capitation fee; whereas the dependants of insured persons—who really needed to be brought into the scheme—were still left outside it. The numbers of patients whom one doctor could attend were limited; in Russia they had begun by assigning 2500 to each doctor, but had now decided that 1000 was a sufficient number for one man to attend. In the British Medical Association the profession had the machinery by which it could make its wishes known, but those who dissented from B.M.A. policy were not sufficiently organised at present to give a unified opinion, and it was for this reason that the Practitioners Coördinating Committee had been formed.

Dr. P. INWALD, discussing the loss of free choice of doctor which any rota system must entail, said that patients attending hospital were willing to accept treatment from doctors whom they had not chosen. He pointed out that the prospects of the general practitioner were not at present secure: if he kept his health, and if his investments were sound he might have an income of £4–£6 a week at 65. If he fell sick or died he generally left his dependants unprovided. General practitioners formed 55% of the profession, and should be represented in this proportion on any body planning for the future of medicine.

A RESOLUTION

In the discussion which followed most speakers accepted the view that a state medical service was likely, and agreed that a united body of opinion from general practitioners would help to safeguard their interests. One speaker, in the municipal service, saw in a state medical service a welcome end to the rivalry between the public-health clinics and the general practitioners. Another warned the meeting that salaries under a state service were likely to fall far short of those attainable in practice; but was reminded by Dr. Fox that a net salary was a different thing from a gross income with high overhead expenses. The following resolution was then presented by Dr. D. LENIHAN, and seconded by Dr. G. W. MACKAY.

> In order to improve the medical services to the public and to provide the fullest facilities of modern medicine, preventive and curative, and in the light of recent developments, recognising the probability of some form of state medical service, this meeting of medical men is prepared to accept such a service provided it includes the following aims: adequate consideration of the just requirements of the general practitioners of the country; adequate compensation for existing practices; salaries based on years of service and experience rather than capitation fees; pensions on retirement; limited daily hours of attendance and time off duty each week; annual leave on pay; periodical refresher courses on pay; opportunities for obtaining specialised experience and research; access to hospitals; clinics established as centres for general practice; fair representation of general practitioners on any planning board for the institution of a state medical service, and in its subsequent administration.

A vote was taken immediately afterwards and the resolution was accepted by a large proportion of those present. Representatives were then coöpted from the members of the various boroughs present, to help in furthering the work of the committee.

SICK BAY FOR SHELTERERS

THE first central shelter sick bay in the London region for those using public air-raid shelters has been opened by the Corporation of London in the basement of 66, Cheapside. It is intended for the use of those shelter dwellers who have minor illnesses of the kind which would ordinarily keep them in bed at home for a day or two, but which, during severe raids, would not restrain them from going to the shelter. Children suspected of incubating an infectious disease can also be kept in bed there, under supervision, until they make their intentions clear. Thus the sick bay should prove a valuable bulwark next winter against the spread of upper respiratory infections and the exanthemata. A doctor is attached to the post, on call, and three or four Red Cross nurses are in attendance.

The white tiled basement two floors below ground level, and protected by many stories of steel and con-

crete, was an ideal site for the new venture. No construction was needed apart from some plain wooden partitions painted white by which the space was divided up into two wards—one for men and one for women—and a consulting-room. Water is laid on, and there are chemical closets on the same floor, while on the floor above there are water-closets and wash-basins. The wards are floored with brown linoleum; each contains six beds but there is room to put up twelve more beds if they are needed. At present they are comfortably spaced out with unusual lockers in white wood standing between them. These lockers can be swung round so that the lower part slides under the bed and the upper part can be opened out as a bed-table. To the newcomer the bed-covers come as a delightful shock to the eye: they are patchwork quilts made by hand in the gayest of colours by the Canadian Red Cross for the W.V.S. Nothing could give a better touch of brilliance and homeliness to the wards. The surgical equipment provided, with much else, by Messrs. Evans Sons Lescher and Webb is simple but plentiful, including Spencer Wells forceps, dressing scissors, ear speculums, irrigators and such usual weapons of the doctor's surgery. It is not intended, of course, that any major surgical procedures will be undertaken in the sick bay. The firm have also supplied a useful assortment of drugs and stock remedies, and have met all the everyday needs of nursing in shaving tackle, bedpans air-cushions and tooth mugs; there is even an electric kettle. The beds and mattresses were provided by the Ministry of Health, and so were the cupboards which are of the type usually supplied to shelters. Pyjamas, dressing-gowns, bedlinen and blankets have come from the W.V.S. The consulting-room is spacious, with a desk, a comfortable divan, and a good light. A Turkey carpet, given by one of the medical staff, robs it of that bleakness which is apt, in hospitals, to have a discouraging effect on patients.

The sick bay has only been open since the last week of August, and so far no patients have been admitted, but the patchwork quilts may soon find themselves on active service.

CANADIAN MEDICAL TRAINING *

MEDICAL education in Canada is primarily the responsibility of the university rather than the hospital. Preclinical subjects, biochemistry, physiology and anatomy are taught in the university, which is closely associated with one or more general hospitals as well as with the civic fever hospitals, children's hospitals, and provincial hospital services for tuberculosis and mental disease. The requirements for entrance to the various universities differ somewhat, but having enrolled at university the student spends one or two years studying physics, chemistry, biology, and the other premedical subjects, or he may be required to proceed to a B.A. degree. The medical course proper requires four, five or six years, the sessions of university in peace-time starting about the third week in September and ending in the third week in May. There is a ten-day holiday at Christmas and a long week-end at Easter. Since the outbreak of war some schools have lengthened the academic year by two months and made changes in the time-table, thus shortening the course by a year.

There is some variation in the plan of the curriculum from one medical school to another but, in all, great emphasis is laid on anatomy, physiology and biochemistry during the early years. The teaching of anatomy, generally speaking, follows the British example of emphasising detailed thoroughness and completeness. Courses in physiology differ but little from those in this country, although perhaps greater opportunity exists for Canadian classes, divided into small groups, to carry out a series of experiments on animals. Research fellowships or appointments are available for undergraduates wishing to spend an extra year working at anatomy, physiology or biochemistry at the universities, particularly at the larger ones. Pathology is a long and heavy course in all schools, and an outstanding effort is made to correlate all aspects of the course—the museum, morbid anatomy and microscopical study—with the problems of clinical medicine. In all clinical subjects teaching at the bedside occupies much of the student's time. Closely supervised activity as a clinical clerk is a feature of the student's final year at university in most of the schools.

Examinations are held at the end of each year and the degree of M.D. is conferred upon successful completion of the final year. Following qualification the almost universal practice is to spend a year as a house-surgeon, while at least two schools require one year of internship in an approved hospital before granting a degree. Excellent opportunities for postgraduate training exist in the hospitals associated with the universities in teaching. In most hospitals, junior residents are appointed for a year during which they work on four or more different services. It is possible to progress through a series of resident appointments in the larger general hospitals to the posts of R.S.O., R.M.O., resident anæsthetist or resident in obstetrics and gynæcology. Fellowships and internships in pathology are filled yearly.

The Royal College of Physicians and Surgeons of Canada conducts primary examinations which the undergraduate is encouraged to prepare for and to try, after the second year of his medical course. The final examinations, in medicine or surgery, are commonly undertaken, as in England, after several years' training in hospital. The universities of Alberta, Dalhousie, Manitoba, McGill, Queen's, Toronto, and Western Ontario are all English-speaking universities. In the Université de Montreal and Laval Université, French is spoken, and teaching has been generally influenced by the French School of medicine.

* This contribution to "Grand Tour" reached us too late to appear in the Students' Guide (*Lancet*, Aug. 31, p. 260).

In England Now

A Running Commentary by Peripatetic Correspondents

How eloquent and incisive are the orations that one makes in the bathroom, how halting and commonplace the speech of which one is delivered in the council chamber. The other day I attended a meeting called by the local medical war committee which was addressed by E.M.S. officials, R.A.M.C. officers and consulting physicians. The audience, composed of consultants, public-health officials and battalion medical officers, took its medicine in glum silence, broken only by a little tepid applause. The hospital officer instructed the hospital staffs to fill in the forms promptly and with due attention; the R.A.M.C. explained to the consultants the inner meaning of the Army's funny little ways; the consulting physicians and a professor of medicine told the regimental medical officers that they must exercise more judiciously their diagnostic powers. The out-patient clinics of the hospitals are apparently crowded with soldiers referred by the R.M.O.'s—soldiers with coughs, with a request that they should be investigated for pulmonary tuberculosis, soldiers with nervous dyspepsia for gastric investigation, soldiers with tachycardia requiring electrocardiographic examination. These investigations were not only unnecessary, it was said, but they were doing much harm to the soldiers. "Come to your conclusions," exhorted the professor eloquently, "and come to your conclusions quickly." The medical officers, in the face of the higher stars of their constellation, were silent. Next morning, while shaving and looking my audience steadily in the eyes, I spoke in their defence:

"It is generally admitted," I began, "that the regimental medical officers of today show a distressing inclination towards second opinions and ancillary investigations. No useful purpose will be secured in suggesting that they should change their habits of mind and practice. The good doctors among them will continue patiently to separate the wheat from the chaff; the less good will, by prodigious exertions, reduce the number of the cases they send to hospital: soldiers with ulcers will be kept in the unit until final breakdown, the gastric neuroses will continue to be sent to hospital for investigation. You must remember," I went on, applying more soap, "that these Army doctors were the family doctors of yesterday and the medical students of the day before. Some of them may have been Professor X's students. Can it have been that their medical education was faulty? Is it possible that they were taught to regard medicine in the professorial units as an applied science and not as a practical art? Certainly they were

taught that the proper investigation of a chronic cough made necessary a radiogram and a sputum investigation; that no chronic dyspepsia could be correctly assessed without chemical and radiological evidence; that cardiac neurosis was established as a diagnosis when electrocardiograms were negative. In short, that neurosis was a negative diagnosis and not to be positively established. Which of us was told by the professors that it was better to miss one case of active tuberculosis or cancer than to confirm five neurotics in their neurosis? When did a professor of medicine come to his conclusions quickly? These R.M.O.'s too, were family doctors yesterday. Today they are told by consulting physicians that they send their patients too readily to hospital for investigation. This is apparently true today and it was equally true yesterday; and yet no-one has heard a consulting physician tell his family-doctor clients that it would be better for their patients if they did not refer them for a second opinion and that some patients are made worse and not better by investigation. The experienced family doctor knows this; the consulting physician knows it too, but it would require a supernatural disinterestedness in him to preach the good news. Moreover most family doctors serve in the national health insurance system which denies them the opportunity to investigate their patients at all deeply; so that reference to hospital with consequent loss of clinical experience or treatment of his patient without diagnostic certitude is the panel doctor's daily dilemma. To learn in what circumstances radiology and pathology may safely be discarded in diagnosis requires a clinical experience which can only be acquired by daily contact with them. The professors seem to have made a genuine discovery which will have incalculable effects on medical education. We may again breed a race of family doctors for whom medicine is a practical art; we may one day give the family doctor a medical service in which ample diagnostic facilities are available for him and his patients."

It seemed to me, as I looked in the mirror, that no words of mine had ever had such a friendly and intelligent reception.

* * *

We were due to arrive at Crewe station in about half an hour, and I noticed with foreboding that little Hector had finished his copy of *Rainbow*. He laid the paper on the seat beside him and looked expectantly at me, obviously inviting further suggestions for defeating boredom. I had noticed, however, that a Polish airman sitting on the opposite side of the compartment had been craning his neck trying to read the outside page of the comic paper. I offered it to him, not without misgivings for I wondered whether he would feel embarrassed. To my surprise, he not only accepted the paper with sincere but slightly incoherent expressions of gratitude, but promptly settled down to read the simple sentences in which the exploits of the Bruin boys are described. Very soon Hector was by his side supplying the low-down on such famous characters as Tiger Tim, Joey the parrot, Georgie Giraffe et alii. The Pole concentrated on the narrative with grim earnestness, and would not allow a page to be turned until he had read every word. When we prepared to leave the train he folded the *Rainbow* carefully and with a courteous bow of his head handed the paper back to my son. Apparently it is not only the British who take their pleasures sadly.

* * *

Present happenings in Iran bring back memories of the arrival in Tehran of our small party in September, 1915. It had left home three weeks before for Bergen and had come via Oslo, Stockholm, Haparanda (at the top end of the Gulf of Bothnia where a frozen river was crossed on foot into Finland), Petrograd and Moscow to Baku; thence by Caspian steamer to the Persian coast and so to the capital, at 3600 feet, by carriage with frequent changes of horses. This meant 225 miles in three days and nights, and crossing the Elburz chain at 7000 feet. Our first sleep was rudely broken. Was there anything that would destroy ciphers without smoke? Better not unpack. The enemy legations were arming Austrian prisoners escaped from Trans-Caspia in the city, and the Swedish officer instructors were joining them with their native gendarmerie. Ahmed Shah was wavering under heavy pressure. Later there came a day when, feeling sure of him, German and Turk, Austrian and gendarmes, complete with hangers-on, moved out to the shrine town six miles south on the road to Isfahan, which they hoped would once again become the capital, and waited. Cabs disappeared from the streets as did food from the shrine. His Majesty's travelling carriage was ready. One final, day-long interview with our own and the Russian ministers and the horses were taken out. Only the hangers-on and the cabs returned, hungry and empty. That was not the end of the Allies' troubles but Iran remained neutral and the danger in the Middle East was scotched, largely by resolute diplomacy, just as it was this week by other means. The nightmare of a return journey receded. We unpacked!

Under Rezah Shah Iran has changed materially in many ways since those days. All credit to him! But two surprising departures from established policy are reported. There are only two things that really matter on the great upland plateau, water and bread. Since no rain falls from May to October men fight and sometimes kill to maintain their immemorial irrigation rights. And bread? It was common in this vast area, with the harvest dependent on the mountain snows, few roads and only animal transport, for there to be famine in one province and plenty in another. A good government was one that kept bread cheap and abundant; nothing else mattered. But now we read of large-scale selling of wheat to the Nazis by the government itself and hunger if not famine. Famine in Iran means typhus and relapsing fever as well. The second surprise is to find the Nazis in key positions, for these used to be given only to nationals of the smaller powers; thus there were Belgians in the posts and customs, Swedes in the gendarmerie and police, and so on. True there were Frenchmen at the medical school, and in the Pasteur Institute and similar posts, but the interests of France were held to be purely cultural; and the Germans had the government hospital up to the last war when it returned to the Persians after two of our own countrymen had completely reorganised it. To what a sorry mess this change of policy has led! However, all's well that ends well, the fighting has stopped at Kermanshah and we can hope that at Hamadan, the next city on the road to the interior, old Avicenna will continue to rest undisturbed by high explosives. Sheikh Abu Ali ibn' Sina, to give him his full name, was a Persian of the eleventh century who wrote their first great system of medicine, the "Qanun," it was translated into Hebrew and Latin and was still read in the seventeenth century at Montpellier, so they say. Physicians had many interests in those days and Avicenna was a minister of state and a poet as well, a judge of wine and other delights. His tomb is still well preserved, and some twenty years ago British initiative led to the restoring of the domed building over it and of the garden in which it stands. So much that is pleasant and lovely in life has come from Iran that one recoils sharply from the thought of her intelligent, hospitable people being plunged into modern war.

* * *

"Any Questions" in the Forces' programme at 5.15 on Sundays is an excellent turn. After a bit one seems to know intimately the various members of the Brains Trust and can often predict the tenor of their replies; the scientific, basal approach of Professor Huxley, the god-like survey of Professor Joad, the not very penetrating but always cheery answers of Commander Campbell, which, I am sure, reflect years of tactful presiding at the Captain's table on liners. Last Sunday the Trust seemed to be unanimous in advocating the same elementary education for all the children in the country and secondary education only for those who show promise. With the justice of this I am in full agreement. Quite a number of public schools really belong to the poor; Harrow for instance was founded for thirty or forty poor scholars, but in fairly modern times the poor scholars have been legally robbed of their inheritance and pushed down the Hill. But I am doubtful about this proposal on other grounds. The cleverest man I know—cleverest in that he gets quickest to the kernel of a subject and expresses it pithily—is a gardener, the most instantaneous and devastating at repartee is an Irish-Cockney ex-paperboy, the best informed works in an ink factory. Presumably, if equal opportunity comes to all, the sort of lads that these people were will become civil servants,

dons and professional men, and instead of getting the nation cleaved by monetary differences it will be by intellectual ones, a deeper schism still. At first glance it seems to me to be like robbing the soil of humus in order to produce a bumper crop or two. In any case it leaves the character side out entirely. Another point: "showing promise" will probably mean aptitude in examinations, in memory, in writing answers, in speaking, in word-proficiency. Both Leonardo and John Hunter, to neither of whom words came easily even in adult life, would have failed here. By the exam method not only would one miss the talented picture-thinker, who develops late and is dreamily lazy (Why the devil should I worry about your wretched grammar when I can sit back and watch glorious pictures?), but one would get those precocious caterpillars, the early word-thinkers, with their excellent memories and no vision, who as perfect insects have been responsible for so much of the mess the world's in today. Perhaps the educationists could devise an exam which would pick out these imaginative children. "Come, Jack (or Jill), tell us a story." I often think we should do the same thing in our professional exams, which at present are almost entirely memory tests. Questions like this: "Invent and describe (*a*) a new vitamin, (*b*) a new venereal disease, (*c*) a brand-new site for the kidneys, showing what anatomical adaptations would be necessary." The whole subject needs rumination.

Public Health

From the Annual Reports

SOUTHERN RHODESIA

Dr. Martin's report for 1939, though delayed, is not curtailed. The estimated population in mid-1939 was 60,720 Europeans, 5840 coloured and Asiatics, and 1,436,560 natives. Southern Rhodesia is not in the Commonwealth of the South African Union (though some politicians of the latter think that it should be) but is an English-speaking colony comparable in many respects with New Zealand. The statistics for the Europeans are not far different from those of a large English county except for malaria, which in 1939 caused 10% of all deaths. The standardised death-rate was 10·3, an increase of 0·6 on 1938; the birth-rate 23·6, and the infantile mortality 45. The maternal death-rate was 2·1 against 2 in 1938, before which year it had been high, in the neighbourhood of 6. Of 1433 live births, 1029 or 71·8% took place in institutions.

During the year 1160 lepers were under treatment at the four institutions in the colony. The death-rate of natives employed in the mines sank from 11·9 in 1938 to 9·8 in 1939, the fall being due entirely to diminished mortality from pneumonia. This in its turn was partly due to diminished incidence (1841 cases against 2215) and partly to a drop in the fatality from 20·4 to 13·2, attributed to the use of M. & B. 693. There was also a lowered incidence of scurvy, but still there were 209 cases with 2 deaths. "Since every case of scurvy detected represents a condition of subclinical scurvy amongst practically all the natives in the area where the case was found, it is obvious that methods of feeding employees still fall far short of satisfactory." A survey of children in the age-group 12 plus revealed infection with urinary bilharzia (*B. hæmatobium*) in 6%, and with the intestinal form (*B. mansoni*) in 4%.

LEEDS

Dr. Johnstone Jervis says: "There was almost an entire absence of epidemic disease; indeed at no time in the city's history has there been less disease of an infectious character than during the eighteen months that have elapsed since hostilities commenced." Epidemic diseases ebbed to a low level never previously recorded in all parts of the world in 1938 and this satisfactory state of affairs has continued until the present day. The war has so far had no material influence on infectious diseases. In Leeds scarlet fever in 1939 gave 960 notified cases with 2 deaths and measles 2274 cases also with 2 deaths. As scarlet fever has been notifiable since 1889 and most cases are treated in isolation hospitals, the fatalities of the disease are known with fair accuracy. We know very little of the fatality of measles, but it has certainly fallen rapidly in recent years. The Leeds 1939 rates of 2 deaths per 1000 from scarlet fever and 1 per 1000 from measles are about average for the present time. Of 54,300 children found naturally immune or immunised against diphtheria in the past twelve years, only 320 developed clinical diphtheria and all recovered. In the three years 1936–38, of 158 children protected by measles serum 23 developed jaundice from four weeks to four months after injection; all recovered. At the time there was an epidemic of infective jaundice in the city, 309 cases being known. The incidence of jaundice was therefore far greater in children who had received measles serum than in the general population. The jaundice which follows injection of measles serum is not a serious matter clinically but is of great interest, for measles serum is of human origin whereas other sera, except that used for poliomyelitis, are of animal origin and do not produce jaundice. It is almost certain that the common form of infectious jaundice—formerly called catarrhal jaundice—is a virus disease and it is quite probable that many people are carriers of this virus.

SWINDON

Dr. Dunstan Brewer in his valedictory report for 1939 draws attention to several ways in which we failed to achieve what we might have done in the inter-war period. The chief of these was the failure of hospital coördination and the failure to give children the benefits of physiological research in estimating and developing their endowments. "Our examination of children is designed to find out what is wrong with them," says Dr. Brewer, "and our efficiency is gauged by the extent to which we meddle with their structure. If we changed to discovering what was right in our children and gave our energy to the direction of functions, we should find that we can rear citizens to a degree of health, happiness and efficiency which my generation never realised."

From the School Reports

DERBYSHIRE

In spite of coming from what is mainly a reception area Dr. W. M. Ash's school report shows that in 1940 there were fewer cases of uncleanliness discovered than in 1939, the actual numbers for the two years being 4782 and 5365. There were 12,816 more inspections and reinspections in 1940 than in the previous year, so the lower incidence is not due to diminished search. On the other hand, scabies (223 cases) was three times as common as in 1939. The number of official evacuees received by Derbyshire in 1940 was 12,115, nearly half of whom came from Southend-on-Sea. The nutrition of the received children was distinctly good—slightly better than that of the natives.

Infectious Disease in England and Wales

WEEK ENDED AUGUST 30

Notifications.—The following cases of infectious disease were notified during the week: smallpox 0; scarlet fever, 958; whooping-cough, 3173; diphtheria, 805; paratyphoid, 197; typhoid, 68; measles (excluding rubella), 1112; pneumonia (primary or influenzal), 363; puerperal pyrexia, 136; cerebrospinal fever, 99; poliomyelitis, 23; polio-encephalitis, 5; encephalitis lethargica, 3; dysentery, 82; ophthalmia neonatorum, 87. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Aug. 27 was 1270; including scarlet fever, 115; diphtheria, 222; measles, 45; whooping-cough 576; enteritis, 22; chicken-pox, 38; erysipelas, 28; mumps, 7; poliomyelitis, 2; dysentery, 21; cerebrospinal fever, 16; puerperal sepsis, 15; enteric fevers, 16; german measles, 1; polio-encephalitis, 2; other diseases (non-infectious), 71; not yet diagnosed, 73.

Deaths.—In 126 great towns there were no deaths from measles, 2 (0) from enteric fever 1 (0) from scarlet fever, 11 (2) from whooping-cough, 24 (0) from diphtheria, 35 (1) from diarrhœa and enteritis under 2 years, and 6 (0) from influenza. The figures in parentheses are those for London itself.

Derby and Newcastle-under-Lyme each reported 1 death from enteric fever. Liverpool and Stockport each had 3 fatal cases of diphtheria.

The number of stillbirths notified during the week was 190 (corresponding to a rate of 38 per thousand total births), including 5 in London.

A YEAR'S WORK AT THE LISTER INSTITUTE

DESPITE dispersal of staff and temporary transfers to the Services, the 47th annual report of work done by members and associated workers of the Lister Institute makes heartening reading at a time when the war has brought research work to a virtual standstill in many of our teaching departments. Much of the work to which reference is made in the report has already been published, and only an outline of what is already a condensed record is possible here.

BACTERIOLOGY AND IMMUNOLOGY

A considerable part of the bacteriological research has a direct bearing on war-time problems. Miss Muriel Robertson, D.Sc., and Mr. James Keppie, M.R.C.V.S. (see *J. Path. Bact.* July, 1941, p. 95), have studied a series of strains of *Clostridium welchii* from war wounds both as regards the optimum conditions for toxin-production and the relationship of toxigenicity in the different strains to the clinical features of the infection. While there was some association between high toxigenicity and severity of the clinical lesion—e.g., most of the strains from cases of gas gangrene gave a high toxin yield—yet poorly toxigenic strains could cause gas gangrene and highly toxigenic strains were isolated from non-gangrenous infections. It is true that the local conditions in the wound are all-important in the ætiology of gas gangrene but a study of the degree of capsulation (cf. Butler, *Med. J. Aust.* 1941, **1**, 33) and of the production of hyaluronidase by strains of *Cl. welchii* from war wounds might throw light on other possible factors affecting the virulence of the organisms. A study of the enzymic content of *Cl. welchii* toxin by Miss M. G. Macfarlane, Ph.D., and Mr. B. C. J. G. Knight, D.Sc., has brought to light a lecithinase which hydrolyses egg-yolk lecithin with the production of neutral fat and a water-soluble phosphorus compound. This finding obviously explains the Nagler reaction—the opalescence produced in human serum or diluted egg-yolk by toxigenic strains of *Cl. welchii*—and may lead to an exact quantitative assay of toxin production by *Cl. welchii* by a phosphorus estimation. Dealing with another of the pathogenic anaerobes, Dr. G. H. Eagles has found that the flocculation reaction cannot be substituted for in vivo tests in the standardisation of tetanus antitoxin.

The treatment of bacillary dysentery has again assumed importance. Miss Dorothy Steabben, Ph.D., has prepared experimentally a protective antibacterial serum against the Shiga bacillus, and it may prove advantageous in treatment to combine such an anti-somatic serum with the ordinarily used Shiga antitoxin. With the help of the ultracentrifuge and electrophoresis apparatus, progress has been made in the identification of the active globulin fractions of antitoxic sera. In the purification and concentration of antitoxins by pepsin-digestion and heat-denaturation, Mr. R. A. Kekwick, M.Sc., and Mr. B. R. Record, Ph.D., found that the resulting loss in potency was associated with the disappearance of the γ-globulin which has the short flocculation time and high in-vivo/in-vitro ratio characteristic of an "avid" serum. Since avidity in the antibody may be important in the treatment of the more severe diphtheritic infections, over-refinement of antitoxin may, as recently suggested by O'Meara, lead to therapeutic inefficiency. The γ-globulin can be easily separated from human serum by salt fractionation but this method largely fails with horse serum, so that some other method for isolating this possibly important fraction in antitoxin needs to be devised. Human serum reconstituted from the dried state after freezing usually has an opalescent appearance. Dr. A. S. McFarlane has found this phenomenon to be due to the coating of the finely divided fat-globules by a layer of β-globulin, and the milkiness can only be got rid of by treating with ether at a low temperature when globulin and fat become separated.

Dr. H. L. Schütze showed that spacing the two doses of a mouse-typhoid vaccine to a month's interval did not affect its protective value against artificial infection, and he concluded that it is safe to give T.A.B. vaccine, combined with tetanus toxoid in two doses at 4–6 weeks' interval. Clinical trials with the agglutinin-response as the measure of protective value are in conformity with this view. The work of Mr. A. Felix, D.Sc., with a new T.A.B. vaccine in which the Vi antigen is preserved by killing the bacilli with alcohol and storing them in it has already been discussed (*Lancet*, 1941, **1**, 543) while Dr. Douglas McClean has recently reviewed his own and others' work on the bacterial production of diffusing factor, now known to be a mucolytic enzyme called hyaluronidase (*Lancet*, 1941, **2**, 797).

NUTRITION

Work has continued on the standardisation of vitamins A and E. For vitamin E, it is recommended that *dl*-α-tocopheryl acetate should now be adopted temporarily by the British Empire and the United States, since its acceptance by the International Conference on Vitamin Standardisation is at the moment impossible. Publication of the results of the tests which have led to the adoption of the standards for vitamins B_1 and D have likewise had to be postponed.

Mr. T. F. Macrae D.Sc., and his collaborators have continued their work on the factors in the vitamin-B_2 complex required by rats. Apart from riboflavin and vitamin B_6, the rat requires the "filtrate factor"; this is now known to contain three components, one of which is pantothenic acid. The chemistry of the remaining two components is rapidly being worked out and active concentrates of them, each free from the other, have been prepared. Dr. Macrae and Miss Alice Copping, M.Sc., have devised new methods for the estimation of vitamin B_6 and of the filtrate-factor complex. They have also used with success their method for estimating riboflavin in foodstuffs. Dr. M. M. El Sadr has completed his studies on the ocular changes produced in rats by deficiency of riboflavin. These changes are, in order of appearance, conjunctivitis, blepharitis, corneal opacity and sometimes cataract. All except the last are cured by the administration of the vitamin. Miss Harriette Chick, D.Sc., and Dr. El Sadr have examined the effect of deficiency of vitamin B_6 and of filtrate factor on the blood of rats. Deficiency of B_6 results in a microcytic anæmia. It is suggested that the rat might prove of value as a test animal in the study of human anæmias.

A comparison has been made of the nutritive values of white and wholemeal flours and of bread baked from them. Dr. Chick and Mrs. C. E. Work, Ph.D., find that the proteins of wholemeal flour show a distinct superiority (30% greater increase in weight in rats) over those of white flour. Dr. Chick has also shown with rats that wholemeal flour is a much richer source of vitamins of the B_2 group. Digestibility tests on six human volunteers, organised by Dr. Macrae, showed that a somewhat higher proportion of energy and of nitrogen were lost in the fæces when wholemeal bread was being consumed instead of white; the results indicate that in the manufacture of white flour of 73% extraction some 20% of the total available energy and 27% of the nitrogen are left in the offals. None of the six subjects was adversely affected by the wholemeal bread, of which each consumed 2–2½ lb. daily.

Miss E. M. Hume and Miss H. Henderson Smith have studied the fat-soluble pigments in flour. They find that only a small part of the yellow pigment is biologically active as provitamin A. There is no difference in the amount of this in wholemeal and in white flour.

Since yeast can be grown comparatively easily, and since it is an excellent source of the B vitamins, its consumption might be of value in maintaining the national health during the war. A series of tests have therefore been carried out on a specimen of yeast (*Tolura utilis*) which might be used for this purpose. Miss Copping has shown that neither the composition of the culture medium nor the subsequent processing of the yeast appreciably affected the quantity of the B_2 vitamins. White flour to which had been added 2½% of *Torula utilis* was found by Dr. Chick to be as rich a source of vitamins of the B group as wholemeal flour. Dr. Macrae has noted that even twice this amount of yeast does not seriously affect the palatability of white or wholemeal breads. He has also shown, in collaboration with workers at the Institute of Animal Pathology at Cambridge, that the protein of *Torula utilis* was of high nutritive value, comparable with a first-class protein such as casein in supplementing biologically poor proteins.

Mr. S. S. Zilva, D.Sc., has continued his work on the vitamin-C content of fruits and vegetables. With Mr. M. B. Crane, he has shown that the amount of the vitamin in tomatoes does not depend to any great extent on the variety but that tomatoes grown in the open contain much more vitamin C than those grown under glass.

BIOCHEMISTRY

Mr. W. T. D. Morgan, D.Sc., continuing his researches on the antigenic complex of the Shiga dysentery bacillus, has by different methods isolated the specific polysaccharide of the organism in undegraded form. This substance is not by itself capable of stimulating the formation of antibody, but in combination with a polypeptide—e.g., from the "O" antigen of *Bacterium typhosum* it becomes a powerful antigen. These studies may explain the development of anti-agar immune-body during the immunisation of horses with agar-grown bacterial cultures, for the non-antigenic agar-polysaccharide probably becomes converted to an antigen by linkage with polypeptides derived from the bacterial growth.

Mrs. Ida Smedley-MacLean, D.Sc., and Miss Hume have carried on their investigations on the fat-deficiency disease of rats. Animals which receive a diet lacking the essential unsaturated fatty acids, linoleic or linolenic, become stunted and emaciated, and it seems that this is not due, as had been thought, to an inability to store or to metabolise fat. The essential fatty acids are required in order to synthesise more highly unsaturated fatty acids such as arachidonic, without which the animal cannot produce new cells and tissues.

The late Prof. R. Robison, F.R.S., and Miss Alice Tazelaar attempted to demonstrate the presence of a cycle of phosphorylation in the cartilage of rachitic rats during the earliest stages of healing. They were able to do this in some experiments but not in others and suggested that there is still some other unrecognised factor in the chemical changes occurring during bone formation.

ENDOCRINOLOGY

The institute has continued its work in endocrinology along several lines. Dr. V. Korenchevsky and his co-workers have studied the effects of gonadectomy and of injections of sex hormones on the thymus. They draw attention to the histological similarity between the epithelial structures in thymomata and in the thymus of rats treated with œstrogens, but note that the epithelial hyperplasia in no case amounted to tumour formation. Despite this, it is clear that œstrogenic hypersecretion must be borne in mind as a possible factor in the formation of thymic tumours. It would be interesting to know whether any muscular changes were observed in the treated animals. Though the diagnosis of myasthenia gravis in a rat might be somewhat difficult on purely clinical grounds, the histological examination of the muscles for lymphorrhages would be a useful extension of the work. The same workers have considered the rôle of œstrogenic hormones in the normal development of the male sex organs and have concluded that added œstrogens produce a very small increase compared with that produced by increasing the dose of androgens. The significance of this is that in practice the synergistic action of œstrogens when given with androgens can be neglected, a conclusion with which most clinicians would agree. Scanty as the evidence is for the beneficial effects of androgens in hyperpiesia and prostatic enlargement, there is still less in favour of combining the male and female sex hormones. Further work has been done on the effects of sex hormones on the livers and hearts of rats. Taken with previous similar work on kidneys, the results make it clear that androsterone and testosterone esters have an important physiological effect in producing growth of these organs. On the other hand, these substances cause lipoid depletion in the adrenals, while neutralising the pathological effects of œstradiol on the zona reticularis.

Sir John Ledingham, F.R.S., has continued his work on the relation between the sex-hormones and the Foà-Kurloff cell (*J. Path. Bact.* 1940, **50**, 201; see *Lancet*, 1940, **1**, 749). Immature and castrated guineapigs showed a greater response, judged by the number of Foà-Kurloff cells in the circulation, to œstradiol dipropionate than to stilbœstrol. Immature guineapigs

Continued at foot of next column

THE LISTER INSTITUTE (*continued*)

were injected with emulsions of spleens from œstradiol-treated guineapigs killed at the height of the response, when the spleen contains large numbers of Foà-Kurloff cells. No clear response was obtained and it is concluded that the substance in the vacuole, if of œstrogenic origin, probably represents some inactive breakdown product.

Letters to the Editor

COMPENSATION AND IDLENESS

SIR,—The disablement training scheme recently introduced by the Ministry of Labour & National Service for assisting the return to useful civilian employment of disabled persons has much to commend it. Circular 2449 makes it clear that the scheme is intended to apply not only to men and women from the Services and civilian air-raid victims but also to those disabled by industrial or civilian accident. A very short acquaintance with the scheme shows that, whilst its success with the first two classes of persons is assured, in the accident class, and especially in those disabled by industrial accident, serious difficulties arise.

Many disabled workmen receive weekly compensation payments over long periods and their return to employment is effectively prevented by the failure of their employers to provide them with suitable work and the unwillingness of insurance companies to settle claims. There are hundreds of able-bodied men scattered throughout the country who, although they are capable of doing essential war work, are kept in enforced idleness by the compensation laws. Surely it should be possible to devise means whereby outstanding claims could be speedily settled or, where this is impossible, settlement postponed until the end of the war and the men released meantime for essential war work?

With the present shortage of man power it does seem a pity that so much valuable labour should remain unutilised.

Harley Street, W.1. J. S. BATCHELOR

"IN QUEST OF A CURRICULUM"

SIR,—Perusal of your valuable and instructive educational number this week prompts me to express some views which I have held for the past few years on the teaching, or mis-teaching, of surgery. These views are based on a short experience as a teacher on the one hand and from contacts in practice with the products of this teaching on the other. We must assume that the qualifying examinations constitute a licence to pursue general practice and they should be designed solely with this end in view. We often hear that a particular individual is a good examination coach but an indifferent teacher and this must be considered an indictment of the examination and not of the coach. If there is going to be a change in the type of teaching it must be initiated from the examination end. For economic reasons students always have, and always will, make the passing of examinations their first consideration and I believe that examiners will have to study more sympathetically the needs of general practice. I can only speak with any practical knowledge of the restricted field of surgery but my experience has been that mistakes in general practice derive almost exclusively from insufficient knowledge of the commonest ailments: the delay in diagnosis of acute appendicitis, the failure to examine an unconscious patient with a head injury for other injuries, the mismanagement of a Colles fracture and so on. I have yet to meet with tragedy consequent on failure to recognise actinomycosis, ignorance of the details of treatment of a tuberculous hip or inability to assess the relative values of perineal excision and abdomino-perineal excision in a case of carcinoma of the rectum—all aspects of knowledge liable to be plumbed in the examination hall.

Should we not do better to concentrate on the essentials and expect a higher standard in a more restricted field? Students should have to memorise facts as little as possible, and think and act for themselves as much as possible. In surgery I should like to see the requirements of theoretical knowledge narrowed to one set book on the diagnosis, preoperative preparation

and after-treatment of a limited number of disorders, written or at least approved by a competent board of teachers. Outside the limits of this set book no other theoretical knowledge would be expected. Students who would otherwise waste their time reading about problems which they are unlikely to meet in general practice would then have more time to absorb the atmosphere of the wards and would feel that time spent in the wards was not jeopardising their chances of passing their examinations, as some anxious students feel today. They should attend the operating theatre only for the study of living pathology and to confirm the significance of physical signs which they themselves have elicited in the ward. For the most part a student would make a better doctor if he spent the time at present devoted to watching operations in going for a walk in the country. Examiners in the qualifying examinations should be continually on their guard against asking questions outside the scope of these essential requirements. The rumour circulating in a medical school that even one examiner is prone to this vice will at once send students scuttling to the library to look up the pathology of brain tumours and Paget's disease of the nipple, the treatment of epithelioma of the anus and the development of hare-lip.

Finally I should like to see introduced into the paper more questions such as these :

Discuss in detail the technique of dressing (*a*) a wound healing by first intention ; (*b*) an open infected wound.

Describe the clinical picture of any abdominal emergency you have seen recently.

The wife of a working man with a large family is found to have a moderate-sized inguinal hernia. Discuss what advice you, as her family doctor, would give her if (*a*) it was decided to operate upon this hernia ; (*b*) she was to be supplied with a truss.

Write an imaginary report for an insurance company on a patient injured in a motor-car accident.

Nuffield House, Guy's Hospital. H. J. B. ATKINS.

BACTERIOLOGY OF IMPETIGO CONTAGIOSA

SIR,—Dr. Cruickshank, while endorsing my plea for a more intensive investigation of impetigo contagiosa, makes some statements to which I should like to reply.

Epidemiological data.—There is a misconception implicit in this paragraph. Dr. Cruickshank states that impetigo "is not apparently a highly contagious disease." In fact, impetigo contagiosa cannot infect intact skin, but in the presence of any flaw in the skin surface—traumatic, by falls or scratching, or excoriations due to a running nose, or a herpes febrilis or labialis—impetigo is most contagious.

I have several times heard the suggestion of some relationship between scarlet fever and impetigo contagiosa, but in the course of six years during which some thousands of cases of impetigo contagiosa have been noted I have found no trace of relationship. Were the vaccinia-smallpox type of relationship present, scarlet fever should surely by now have disappeared.

"Nephritis has been noted as a complication of impetigo." I know of one reference in an American journal which I was unable to obtain. The association must be very rare. It is however not uncommon for patients who are sensitive to white precipitate ointment to develop albuminuria and general anasarca while undergoing treatment for impetigo contagiosa. If the presence of nephritis argues for a scarlatinal type of streptococcal agent, then the absence of it from thousands of cases of very severe impetigo contagiosa may suggest that the hæmolytic streptococci found are not causal.

Treatment.—I cannot understand the difficulties experienced in treating this complaint if three rules are observed :

1. Never scratch.
2. Never remove scabs.
3. Never let water touch the skin.

White precipitate ointment, calamine lotion or talc powder are my medicaments of choice, but probably almost anything else not too wetting would do equally well. In the presence of seborrhœa or mercury sensitivity, calamine lotion is preferable. Simple Elastoplast occlusion is often very convenient. The only real difficulties I have encountered are seborrhœic skins, and impetigo contagiosa on an œdematous leg (this formed a large chronic ulcer).

Bacteriology.—The consensus of opinion today may be in favour of a hæmolytic streptococcus as causal agent, but I had hoped Dr. Cruickshank was going to submit the premiss to re-examination. Unfortunately he quite arbitrarily selects the 15 streptococcal cultures recovered from 23 cases as causal, whilst rejecting the 18 staphylococcal growths as secondary invaders. May I repeat my plea for a search for a *constant* causal organism in impetigo. It may be a streptococcus, a staphylococcus, a diplococcus, a pleomorphic organism, a filter-passing virus, a mite, a worm or a spirochæte, but it will be recoverable from all cases of impetigo contagiosa, and will probably have the following characters :

1. It will produce impetigo contagiosa in humans.
2. It will not produce impetigo contagiosa in animals.
3. It will fail to produce erysipelas, scarlet fever and boils.
4. It will not be recoverable from erysipelas, scarlet fever and boils.
5. It will produce no, or very little, local or general immunity.

Were I a betting man I should put my shirt on the very large diplococcus, often intracellular in the pus cells, constantly found in the direct smears, and first described in 1897 by Balzer and Griffon.

Beaminster, Dorset. R. E. HOPE SIMPSON.

Medical News

Epsom College

The council of the college will shortly proceed to award St. Anne's scholarships to girls attending Church of England schools. Candidates must be fully 9 and under 16 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than 5 years. The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected. The conjoint committee will in November award a Challice annuity of £32 per annum to a qualified medical man who, on account of old age, has been compelled to retire and who is in need. Forms of application can be had from the secretary's office, Epsom College, Surrey, and must be returned by Oct. 14.

Medical Honours

The George medal has been awarded to Mr. R. W. Wyse resident surgical officer at Salford Royal Hospital, and to Dr. Leonard Findlay, medical superintendent of Mill Road Infirmary, Liverpool.

Naval Casualties

In a recent casualty list T/Surgeon Lieutenant A. T Leggate, M.B. Lpool, R.N.V.R., is posted as missing, presumed killed. Surgeon Lieut.-Commander William Greaves, M.B. Leeds, R.N., is reported to be a prisoner of war.

Tavistock Clinic

A luncheon in celebration of the 21st anniversary of the clinic will be held at Grosvenor House, Park Lane, London, W.1, on Monday, Sept. 29, at 1 P.M. Further information may be had from the secretary of the clinic, at Westfield College, Kidderpore Avenue, N.W.3.

Liquid Paraffin Emulsions

A defence regulation is shortly to be issued prohibiting the manufacture of any emulsion of liquid paraffin containing more than 25% by volume of liquid paraffin. Some proprietary emulsions contain proportions as high as 65%, but the Therapeutic Requirements Committee are satisfied that a 25% emulsion is as effective as the pure oil. The National War Formulary, which is now in proof, will contain a 25% emulsion.

Lecture on Industrial Health

The Henry George School of Economics have arranged six lectures on economic problems of today under the title Facts Behind the News. In the series Dr. H. B. Morgan, M.P., will deal with industrial health on Tuesday, Sept. 23, at 6 P.M. The lectures will all be held at the school, 13, Suffolk Street, Pall Mall, S.W.1.

Corrigendum.—In Dr. J. D. Robertson's letter of Sept. 6, p. 294, col. 2, for "vitamin-storage work" read "calcium-storage work."

Notes, Comments and Abstracts

A GLYCERIN-GELATIN BASE FOR IRRADIATION DERMATITIS AND BURNS

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M. LEDERMAN, M.B. LOND., D.M.R.E.
RADIUM THERAPIST TO THE HOSPITAL

THE cutaneous phenomena observed after radium or X-ray treatment can be subdivided into two groups—acute and chronic. The first includes the reactions ranging from erythema to a moist desquamation which are comparable to a first or second degree burn. The second includes the persistent, painful ulceration termed an X-ray or radium "burn" and various other sequelæ of treatment—e.g., telangiectases, atrophy, chronic œdema and hyperkeratosis. Apart from the cosmetically unwelcome ones, such as atrophy and œdema, the more pernicious sequelæ are, thanks to improvement of apparatus and technique, not commonly seen nowadays, and the acuteness of any reaction can be controlled by suitable attention to treatment and dosage.

It has been customary since the earliest days of radiotherapy to apply unguents to these raw areas, but of recent years tannic-acid jelly has achieved some popularity. Whereas oily substances or unguents tend to obstruct drainage and spread infection, a jelly forms its own dressing and has none of these disadvantages. It was found, however, that when used on skin surfaces that were normally prone to movement, such as near the mouth, on the neck or in the groin folds, it was impossible to obtain a crust of even thickness. Owing to the irregularity of distribution and lack of pliability the crust fissured readily, caused discomfort and required constant renewal. Some degree of infection was also encountered in an appreciable number of cases. The tendency to crack was exhibited, though in lesser degree, by flavine when immobilisation of the area treated was either impossible or inadvisable. An attempt was made, therefore, to find means whereby pliability could be increased. Finally, the desired result was attained by the addition of a glycerin-gelatin base. The composition of this application is as follows:—

℞ Proflavine	.. ..	gr. 4½
Glycerin suppository (mass)		gr. 375
Distilled water ad.	..	10 fl. oz.

Dissolve the proflavine in the water, making a solution of 1 in 1000; warm and add the glycerin suppository mass; when dissolved strain through gauze. Apply from an all-glass spray.

An extensive trial of this simple preparation has been carried out in the radium department of the Royal Cancer Hospital in cases where the skin shows moist desquamation—i.e., loss of superficial layers of the true skin. We have been sufficiently impressed by its efficacy to justify us in bringing it to general notice. Its advantages are:—

1. It is antiseptic—a point of importance when it is realised that irradiated skin resists infection but feebly.
2. The crust is of even thickness, flexible and forms its own dressing; the solution is easy to apply by means of a glass spray.
3. It is cheap and simple to make.

For cases which show an idiosyncrasy to proflavine, gentian violet, methylene-blue, brilliant green, or a combination of them, can replace the proflavine. The sole objection to the application is that it contains glycerin, which is on the list of drugs in the use of which we are asked to exercise strict economy. We have been unable to find a satisfactory substitute.

We are indebted to Mr. J. H. Wood, pharmacist to the Royal Cancer Hospital, for advice and technical assistance.

BOMBS AND MILK

Rowland and Hinks [1] have studied the yield and the composition of the milk from herds near to which bombs had dropped. In some cases the yield fell, in others it remained unchanged, but in all cases the milk immediately after the incident did not show any significant difference in composition from that obtained several days later. In one instance milk had been taken the day before the bombing for a partial analysis and this also confirmed the findings that bombing caused no change in the composition. The defence in prosecutions for the sale of adulterated milk has already shown a tendency to allege that the poor quality was due to the herds having been bombed and these investigations were undertaken to examine the validity of such a contention.

1. *Analyst*, August, 1941, pp. 327 and 328.

MAN OR SPIDER

MOST poets begin young, and to publish a slender volume of verse in the early twenties used to be considered comme-il-faut. Indeed Hardy once said he thought that the shortest way to good prose was by the route of good verse. Dr. David Stafford-Clark is a poet living in swift exciting times and he has made the most of his chances.[1] His glimpses of May on the Cherwell, chapel at Oxford, his mannered valentines, epitaphs and sonnets already have the gentle charm of something we—and he—have lost. But even in 1937 contradictions of the world amazed him. In his lines to the black widow spiders at the Zoo doomed to die when the first bombs fall he says:

". . . For it would be dreadful
If, living through the gas and bombs his fellow men have dropped,
Someone should perish
Of your pathetic poison."

His address to the modern poets who cannot bear "any slavishly direct attempt to say anything" is a withering blast of sarcasm.

In the later poems of the war Dr. Stafford-Clark shows generous indignation at wanton pain and ugliness and an understanding of the exaltation of battle which exists alongside it.

". . . the exultant lust
To destroy and risk destruction
Suddenly canonized by war."

SIGNIFICANCE OF FEAR

IN a recent Honyman Gillespie lecture in Edinburgh Prof. D. K. Henderson said that the trend of medicine in general had been towards the protection of the unfit but emotional, and instinctive needs had largely been left to chance. This neglect was followed by the occurrence of nervous and mental disease. There was a fatalistic outlook on the inevitability of mental disease and consequently a state of therapeutic nihilism. Modern psychiatry was striving to demonstrate that this attitude was false and that much valuable preventive or early curative work was possible. Fear, which was one of the most widespread human emotions, could be both good and bad. Fear might provide for safety, as in the self-protection behaviour of animals, and in the human it might also provide for social integration, particularly the fear of punishment or ridicule. Fear resulted in disturbance of the autonomic nervous system with many physical manifestations and might lead to disorders which could not be cured by the physician or surgeon unless the underlying anxiety were removed. It was always to be remembered that a man might demonstrate bravery owing to his fear of being afraid and it was fear itself which was the fundamental cause of the adoption of superstitious practices. Professor Henderson believed that fear was more social than sexual in its origin and that it depended on separation from the mother both in children and adults. Fear and loneliness went hand in hand. In children fears and anxieties which might subsequently give rise to serious nervous disease were often initiated superficially by casual remarks of maids, nurses, or mothers. He criticised our educational system in which there was no attempt to differentiate between those children who were able to stand its rigours and those who by their innate constitution were unable to do so. He believed that this was important in the production of nervous and mental illness which might be avoided if more care were exercised in the choice of schools and in assessment of the stability of the child. Fear states initiated in childhood persisted into adult life, usually in highly sensitive, artistic people who disliked loneliness and might come to use alcohol

1. Autumn Shadow. Oxford: Basil Blackwell. Pp. 62 5s.

as a means of maintaining a uniform state. They came to be dominated by unreal fears for health, life and so on, and at first they repressed their fears and put up a good show. This was usually because of the additional fear that they would be ridiculed or thought mad if they spoke freely. They usually avoided speaking of their fears even after these had been present for many years and a tremendous continual nervous conflict developed which was more fatiguing than the heaviest physical exertion. It was demonstrated externally by asthenia, lack of concentration and loss of spontaneousness, together with physical features which might be referred, for example, to the heart or the digestive system. Doctors should try to obtain the psychological background of their patients, particularly those suffering from psychoneurosis. It was necessary to know the background against which their symptoms had developed before modification or cure could be obtained, and in the long run time spent in this elucidation was time saved. We must study and supply the psychic needs of the child just as much as we did his physical needs but it was surprising how dangerously little attention was paid to this. Equally the subjective aspects of illness of all kinds were inadequately studied.

EAR, NOSE AND THROAT SPECIMENS IN THE ROYAL COLLEGE OF SURGEONS

STC. T. writes: London possessed perhaps the largest and most valuable collection of museum specimens in existence illustrating the surgery of the ear, nose and throat. The museum of the Royal College of Surgeons received one of its earliest gifts illustrating the normal anatomy of this region from Toynbee, who presented 300 specimens of the temporal bone; these were later enriched with Arthur Cheatle's unrivalled series of sectioned temporal bones. The basis of the group of specimens related to rhinology was formed when the large collection of Onodi, from Budapest, was secured and presented by British oto-laryngologists. A valuable addition to the laryngological section of the museum was made by V. E. Negus, who presented the specimens on which he founded his classic study of the comparative anatomy and physiology of the larynx; these escaped damage when the museum suffered during the bombing in May last. Owing to the dispersal, for greater safety, of the specimens then undamaged it has not yet been possible to compile a complete statement of the loss suffered by the museum from enemy action, but the catalogues of the museum have been preserved and it will be possible to reproduce many specimens of normal anatomy from fresh material. The Onodi collection was heavily damaged, but about 95 specimens are intact, and the others, being of normal human anatomy, can in time be replaced. The Toynbee and Cheatle collections have suffered even more severely, but it is to be hoped that after the war young aural surgeons will re-establish them. The 14 specimens of the anatomy of the paranasal sinuses, recently presented by the late Professor Hajek, are intact. These formed part of the specimens which Hajek had shown, during nearly 50 years, in his famous practical classes.

ALMONERS CARRY ON

THE almoners department of the Royal Infirmary, Newcastle-on-Tyne, experienced a lull in its activity at the beginning of the war. Admissions to the hospital were cut down and outpatients also became fewer owing to evacuation. A new task fell to the almoners, however, who had to arrange the transfer of convalescent patients to E.M.S. hospitals. Outpatient attendances have gradually increased again but not to prewar level, since people are unwilling to travel far to seek advice—especially during the darker months—unless there is something urgently wrong. All convalescent homes on the north-east coast of Northumberland have been closed, the only convalescent homes for adults now available being at Ilkley in Yorkshire and Silloth in Cumberland. The Silloth home also takes children over six. Children from five to fourteen can go to the Children's Holiday Association Home at Whickham; and those between three and thirteen can go to the infirmary's own home at Greycourt Riding Mill, and to Newbrough Lodge. Children who need nursing—orthopædic cases with legs in plaster, for example, or children with chorea—can be looked after at these two homes and can get complete rest. They have returned looking normal and healthy, and showing a good gain in weight. One convalescent home which took women and children, including mothers and their babies, was in a much-raided area and at last had to close; another was taken over by the Government for other purposes.

Spa hospitals have remained open for patients with rheumatic complaints, and the infirmary almoners have continued to send patients to Harrogate and Buxton and to keep an eye on them when they returned to work. Acting as almoners in the original sense, they have arranged for grants from the National Society for Cancer Relief to provide extra nourishment for needy patients. Of the 18 patients helped during the year, 10 died; but the grants for invalid diet did much to make their last illnesses more tolerable. Of the rest, 6 are still receiving weekly allowances and are making good progress, and 2 have been crossed off the list, as showing no further evidence of cancer. These 2, who were very poor, were treated with radium, one for three, the other for ten months. They put on weight steadily, and the grant was not stopped until they were reported to have recovered from their treatment. Grants from the Soldiers, Sailors and Airmens Families Association have been administered to the wives of men in the Services. Their government allowances cover their ordinary needs, but the grants have been invaluable for special expenses arising during illness—for example, to pay the cost of ambulances, of surgical appliances and of extra food. The Tyneside Council of Social Service has visited many of the infirmary patients during the year and has given grants for convalescence and to provide special treatment or appliances where these were needed. The almoners have also been able to help a girl who was crippled by arthritis to find work, and to find homes for two children whose parents were separated and whose mother was mentally unfit to look after them. These samples from the duties of an almoner give only a shadowy idea of the thought, tact and energy which go to the successful care and aftercare of even a single hospital case.

Appointments

CASSON, F. R. C., M.B. Lond., D.P.M.: M.O. (A.R.P.) for Southwark.
CORY, R. A. S., M.B. Bristol.: senior M.O. at Jamaica.
FORSYTH, W. W., M.B. Glasg.: examining factory surgeon for Darlington, co. Durham.
RALSTON, MARGARET, M.B. Edin.: temp. asst. school M.O. for Derbyshire.
REID, J. D., M.B. Edin., D.P.H., D.T.M. & H.: asst. bacteriologist at Sierra Leone.
UNGAR, EMIL, M.D. Prague: asst. radiologist in the therapeutic department, Royal Cancer Hospital (Free), London.

Births, Marriages and Deaths

BIRTHS

ANSELL.—On Sept. 1, at Winchester, the wife of Dr. J. L. B. Ansell—a daughter.
CARLTON.—On Aug. 5, at Epsom, the wife of Colonel C. Hope Carlton, R.A.M.C.—a son.
MASON.—On Sept. 6, at Derby, the wife of Captain James Mason, R.A.M.C.—a daughter.
OFFICER.—On July 1, at Deolali, India, the wife of Major W. J. Officer, R.A.M.C.—a daughter.
PROCTOR.—On Sept. 2, the wife of Captain Henry Proctor, R.A.M.C. —a daughter.

MARRIAGES

HARBINSON—DICK.—On Sept. 1, at Taplow, David Lowry Harbinson, M.B., R.A.M.C. to Nancy Kate Dick, M.B.
INGHAM—COOPE.—On Sept. 3, at Bolton, Arthur Ingham, M.B., to Lucy Angela Coope.
ILIFF—COX.—On Sept. 3, at Gulmarg, Kashmir, Arthur Durnford Iliff, M.R.C.S., C.M.S., to Elizabeth Vera Cox.
LITCHFIELD—HATHERLY.—On Sept. 5, in London, Jack Litchfield, M.R.C.P., to Nan Hatherly.
OGILVIE—TORRENS.—On Sept. 6, at Lee-on-Solent, Joyce Patrick Heneage Ogilvie, M.R.C.S., elder son of Colonel W. H. Ogilvie, A.M.S., to Jean Mary Torrens.
SYMMERS—WRIGHT.—On Aug. 28, at Belfast, William St. Clair Symmers, surgeon lieutenant, R.N.V.R., to Jean Noble Wright.

DEATHS

DINNICK.—On Sept. 4, at Launceston, Oswald Tilson Dinnick, M.B. Toronto, F.R.C.S.E.
HARRISON.—On Sept. 8, James McKean Harrison, M.B. R.U.I., of Tunbridge Wells.
HIGHET.—On Sept. 5, Robert Campbell Highet, T.D., M.D. Glasg.
WOOD.—On Sept. 4, at Hungerford, Berks, Guy Edward Mills Wood, M.B. Durh., M.R.C.P.

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2. The administration of thyroid or other compounds of the nitro-phenol group by mouth.
3. The prescription of foods such as broths, meat extracts, etc.

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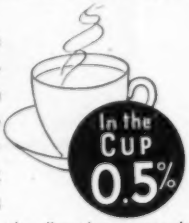
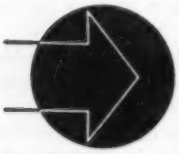


When the hot milk meets the cold mixture the resulting temperature is correct for the enzyme action. Within two minutes the starch of the wheaten powder has been made soluble so that prepared Benger's Food contains only 0.5% of insoluble starch. As the digestion proceeds the trypsin modifies the milk protein so that when it comes in contact with the gastric juices, it separates into fine flocculi, as compared to the heavy tough curd formed by milk itself. Both actions take place whilst the Food is too hot to drink.



For Infants, Invalids and those suffering from severe digestive weakness, the time for pre-digesting Benger's Food should be extended to 15 minutes and upwards to 45 minutes. At the end of this period the wheaten powder is converted to dextrins, dextri-maltoses and maltose, and the milk proteins modified so that the finest possible curd is formed on contact with the gastric juices.

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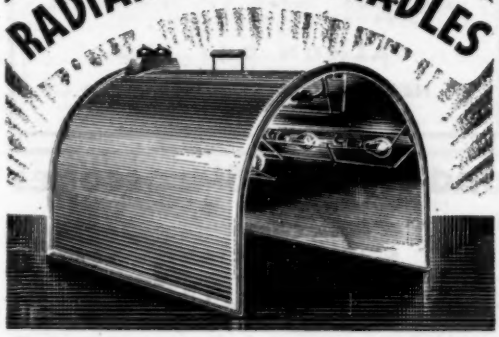

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THE WINTER SESSION OPENS ON WEDNESDAY, OCTOBER 1st

The London Hospital remains the headquarters of the Medical School. The beds have been reduced from the pre-war figure of 900 to 350; 100 are held in reserve for air-raid casualties, but an Annexe has been opened at Brentwood with 360 beds. The organisation of the Emergency Medical Service at the beginning of the war brought the Medical School into relation, through the London Sector Scheme, with all the Hospitals in Essex and many in London, Middlesex and Hertfordshire. The clinical facilities in the Medical School have been greatly increased by the war.

The Departments of Anatomy, Physiology and Pharmacology are temporarily transferred to Cambridge under our staff of Professors and Readers. Courses for the Primary Fellowship are held in Cambridge twice a year in conjunction with St. Bartholomew's Hospital. Chemistry, Physics and Biology are taught at Queen Mary College, also temporarily in Cambridge. The Price Entrance Scholarship in Science (Chemistry, Physics and Biology) will be awarded on an Examination in April.

The Dental School remains at the London Hospital and provides teaching in all branches of Dental Surgery. The attendance of patients in the Dental Out-patient Department has been little influenced by the war. The Francis Farmer Entrance Scholarship (in Chemistry, Physics and Biology) is awarded in September.

Clinical students are posted in the first instance to Chase Farm Hospital, Enfield, or to St. Andrew's Hospital, Billericay, near the London Hospital Annexe at Brentwood, and then, after a Course in Pathology, to the London Hospital Annexe at Brentwood or to the North Middlesex County Hospital at Edmonton (1000 beds). In the final year, after a period as Student House Officers at Sector Hospitals, they return to the London Hospital for preparation for the final examination. This organisation can be adapted to any circumstances which may arise.

A large number of House Appointments for recently qualified students are available at the London Hospital, the Annexe at Brentwood, Chase Farm, E.M.S. Hospital, the North Middlesex County Hospital and the Hospitals in Sector II and the 4th Civil Defence Region.

Three entrance scholarships in Anatomy, Physiology, Pharmacology and Biochemistry are awarded in April and June. Funds to the value of over £100,000 are available for Medical Research.

The College provides an Athenæum, Dining Hall, Library, Museum, Gymnasium, Fives Court, three Tennis Courts and two Squash Courts. All are in use during the war. The athletic ground at Hale End can easily be reached from the Hospital by train or road.

Further details may be obtained from the Dean, A. E. CLARK-KENNEDY, M.D., F.R.C.P., Physician to the Hospital and Fellow of Corpus Christi College, Cambridge, who is always ready to see students by appointment at the London Hospital or at Corpus Christi College at Cambridge.

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INTENSIVE COURSE ON WAR MEDICINE
29th September to 3rd October, 1941

Monday, 29th Sept.	10 A.M.	Effort Syndrome	Dr. P. H. Wood, M.D., F.R.C.P.
	11.30 A.M.	The Prevention in Barracks and the Field of Certain Wartime Diseases of Special Military Importance.	Lieut.-Col. C. S. Ryles, C.B.E., R.A.M.C.
	1.30 P.M.	Crush Injuries	Dr. E. G. Bywaters, M.R.C.P.
	3 P.M.	Prescribing in Wartime ..	Dr. P. Hamill, F.R.C.P.
Tuesday, 30th Sept.	10 A.M.	War Neuroses	Colonel J. R. Rees, M.D., M.R.C.P.
	11.30 A.M.	Trench Fever and Trench Nephritis.	Sir Arthur Hurst, D.M., F.R.C.P.
	1.30 P.M.	The Prevention in Barracks and the Field of Certain Wartime Diseases of Special Military Importance (*contd.*).	Lieut.-Col. C. S. Ryles, O.B.E., R.A.M.C.
	3 P.M.	Effects of Blast	Dr. S. Zuckerman, M.A., D.Sc.
Wednesday, 1st Oct.	10 A.M.	Skin Diseases in War ..	Dr. R. T. Brain, M.D., F.R.C.P.
	11.30 A.M.	Protective Inoculation with Special Reference to Tetanus.	Dr. P. Hartley, M.D., F.R.C.P.
	1.30 P.M.	Treatment of Gas Casualties	Professor J. A. Nixon, C.M.G., M.D., F.R.C.P.
	3 P.M.	Food Poisoning	Professor J. H. Dible, F.R.C.P.
Thursday, 2nd Oct.	10 A.M.	The Pathology of War Gas Poisoning.	Professor G. R. Cameron, D.Sc.
	11.15 A.M.	Medical Management of Chest Wounds.	Dr. W. D. Brooks, D.M., F.R.C.P.
	1.30 P.M.	Medical Aspects of Head Injuries.	Major W. R. Russell, M.D., F.R.C.P.
	3 P.M.	Dyspepsia in War . ..	Dr. C. E. Newman, F.R.C.P., and Mr. R. T. Payne, M.S., F.R.C.S.
Friday, 3rd Oct.	10 A.M.	Dietetic Deficiencies in War	Professor S. J. Cowell, F.R.C.P.
	11.30 A.M.	Sulphonamide Drugs in War	Colonel L. E. H. Whitby, C.V.O., M.D., F.R.C.P.
	1.30 P.M.	War Neuroses (*contd.*) ..	Colonel J. R. Rees, M.D., M.R.C.P.
	3 P.M.	Practical Management of Wound Shock.	Dr. J. McMichael, M.D., F.R.C.P., F.R.S.E.

The fee for the Course will be one guinea, but no fee will be charged in the case of Officers of the Armed Forces and whole-time Officers of the E.M.S. who submit a leave certificate and register their names before the commencement of the Course.

Applications for admission should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, W.12.

Further War Surgery courses will commence as follows:—
TREATMENT OF FRACTURES .. .. MONDAY, 13TH OCTOBER.
WAR SURGERY OF THE CHEST .. MONDAY, 27TH OCTOBER.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, October 13th, November 10th, December 8th; MEDICINE, October 20th, November 17th, December 15th; MIDWIFERY, October 21st, November 18th, December 16th.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

PRELIMINARY EXAMINATIONS FOR MEDICAL AND DENTAL STUDENTS

The College of Preceptors holds Preliminary Examinations in March, June, September, and December. For regulations, apply to the Secretary, College of Preceptors, at temporary address, 31, Corkran-road, Surbiton, Surrey.

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The course of instruction can be commenced at any time. Candidates holding appointments are admitted to Part II Course as part-time students.

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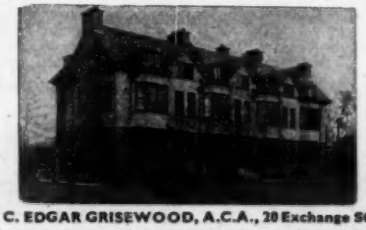

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For further particulars apply Secretary,

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Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

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STRETTON HOUSE,
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ESTABLISHED IN 1853.

A PRIVATE HOME for the treatment of gentlemen suffering from Mental and Nervous illness, including the allied Disorders of Alcoholism and the Drug Habit. All types of early Mental and Nervous Cases are received without Certificates as Voluntary Patients under the provisions of the Mental Treatment Act, 1930. Bracing hill country. See "Medical Directory," p. 2358.—Apply to the Medical Superintendent. 'Phone 10 P.O., Church Stretton.

CHISWICK HOUSE,
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Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

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THE COPPICE, NOTTINGHAM.
HOSPITAL FOR MENTAL DISEASES.
President: The Right Hon. LORD BELPER.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. Voluntary and Temporary Patients received. Occupational Therapy. For terms, &c., apply to the Medical Superintendent.
Telephone: 64177 Nottingham.

HOLLOWAY SANATORIUM VIRGINIA WATER

A Registered Hospital for the Treatment of MENTAL DISORDERS of the EDUCATED CLASSES. Founded by THOMAS HOLLOWAY in 1885.

This Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Bedrooms and Special Nurses as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a Branch Establishment at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and be provided with all the comforts of a well-appointed home.

For Terms, apply to—
The RESIDENT MEDICAL SUPERINTENDENT, St. Ann's Heath, Virginia Water, SURREY

VALE OF CLWYD SANATORIUM

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level, on the South West slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X-Ray plant. Every facility for Artificial Pneumothorax and for operations on the chest. Electric Lighting. Central Heating. Home Farm. Grade A Milk from T.T. Herd.
For particulars apply to Medical Superintendent.
H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

FENSTANTON, at "FIVE DIAMONDS," Chalfont St. Giles, Bucks.
A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (*See Medical Directory*, p. 2346.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

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'Phone: BEDFORD 3417. **Near BEDFORD**
For Mental Cases with or without Certificates.
Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).
For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.
INTERVIEWS IN LONDON BY APPOINTMENT.

PORTSMOUTH CITY MENTAL HOSPITAL
Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds with sea views.
Charges from 3 guineas weekly, including all necessaries except clothing.—Apply to the Medical Superintendent and Resident Physician, THOMAS BEATON, O.B.E., M.D., F.R.C.P.

THE GROVE HOUSE,
CHURCH STRETTON, SHROPSHIRE.
Private Home for Ladies mentally ill. Voluntary and Temporary Patients received.
Medical Superintendent: Dr. J. A. MCCLINTOCK.

MALLING PLACE, KENT
For LADIES and GENTLEMEN of Unsound Mind.
Terms moderate. Apply to Resident Medical Superintendent.
Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

THE OLD MANOR SALISBURY

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden and Dairy Produce from own farm. Terms very moderate.
CONVALESCENT HOME AT BOURNEMOUTH Detached Villas standing in 12 acres of ornamental grounds, with tennis courts, etc., which Voluntary, Temporary or Certified Patients may visit by arrangement for long or short period.
Illustrated Brochure on application to the Medical Superintendent. The Old Manor, Salisbury. Telephone: Salisbury 3216 and 3217.

HAYDOCK LODGE,
NEWTON-LE-WILLOWS, LANCASHIRE.

For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES suffering from Mental and Nervous Disorders, Alcoholism and Drug addiction, either voluntarily, temporarily, or under certificate. Patients are classified in separate buildings according to their mental condition. Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *'Phone:* Ashton-in-Makerfield 7311. *Tele. Address:* Street, Ashton-in-Makerfield.

THE CASSEL HOSPITAL FOR FUNCTIONAL NERVOUS DISORDERS

new address: ASH HALL, BUCKNALL, near STOKE-on-TRENT, STAFFS. *Telephone:* ASH BANK 215

Owing to existing circumstances the hospital has been transferred from Swaylands, Penshurst, Kent, to the above address for the duration of the war. Ash Hall is situated in the country about 5 miles from Stoke in the direction of Ashbourne.
The hospital will continue to admit for treatment patients of moderate means suffering from psychoneurotic illnesses.
Patients suffering from psychotic illnesses are not eligible for admission.
Further particulars may be obtained by application to the Medical Director at the new address.

THE LAW NURSING HOME
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Founder: The late SIR A. J. LAW, J.P., M.P.

A Private Hospital, exclusively for the treatment of POST-ENCEPHALITIC PARKINSONISM, PARKINSON'S DISEASE and ALLIED DISORDERS

The Nursing Home is governed by Trustees; any surplus is utilized to help patients who cannot afford full fees. Extensive grounds. Hydro. Expert Massage and Physical re-education. Dietary treatment. Equipped with every laboratory apparatus for the investigation and treatment of the diseases. Results of the BULGARIAN TREATMENT published (*Lancet*, 1939, 1, 693) approx.: 300 patients treated in the last 3 years. Terms moderate. Further particulars apply Medical Superintendent. Tel.: Rochdale 2960.

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A Private Clinic, the first in Great Britain, for investigation and treatment of all forms of disease, except infectious and mental

There is a steel and concrete Air Raid Shelter with heating and a lift to all floors

Inclusive charges Apply SECRETARY Telephone: Ruthin 66

NORTHUMBERLAND HOUSE
GREEN LANES,
FINSBURY PARK, N.4

A PRIVATE HOSPITAL for the treatment of mental and nervous illnesses. Conveniently situated and easy of access from all parts. Six acres of ground facing Finsbury Park. Voluntary and Temporary Patients received without certification. Occupational Therapy, Psychotherapy, and other modern forms of treatment. Air-raid Shelters have been provided.
Telephone: Stamford Hill 2688. *Telegrams:* "SUBSIDIARY, LONDON."
For further particulars apply to the MEDICAL SUPERINTENDENT.

CRICHTON ROYAL, DUMFRIES

For NERVOUS AND MENTAL DISORDERS

Separate Villa for patients suffering from the effects of alcoholism and drug addiction. Every facility for complete investigation and individual treatment on the most modern lines. Fully equipped gymnasium, golf course, and indoor swimming pool. Specially trained occupational and recreational therapists. **Special Department for Insulin Therapy.** As the hospital is well endowed terms are exceptionally moderate, e.g., First Department from 3 guineas per week, Second Department, 2 and 2½ guineas per week. Voluntary and certified patients are received. Medical Certificates given anywhere in the British Isles are valid for admission of patients. *For prospectus, necessary forms, and further information apply to:—*
Physician Superintendent, P. K. McCowan, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law. *Tel.* Dumfries 1119

ST. ANDREW'S HOSPITAL

FOR NERVOUS AND MENTAL DISORDERS, NORTHAMPTON

FOR THE UPPER AND MIDDLE CLASSES ONLY.

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, K.G., C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., M.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombieres treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 2356 and 2357 Northampton), who can be seen in London by appointment.

CHEADLE ROYAL HOSPITAL, Cheadle, Cheshire.

This REGISTERED HOSPITAL, with a SEASIDE BRANCH at Colwyn Bay, N. Wales, is for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL AND NERVOUS DISEASES.

The Hospital is governed by a COMMITTEE, appointed by the TRUSTEES of the Manchester Royal Infirmary.

In addition to the Main Buildings there are separate villas. Extensive grounds. Hard and grass tennis courts, cricket and croquet grounds, and a court for badminton. There are also wireless installations. Golf may be had within easy distance. Occupational Therapy.

VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS received.

The Hospital is nine miles from Manchester, 50 minutes by rail from Liverpool, and 3½ hours from London.

For terms and further particulars apply to the Medical Superintendent, who may be seen in Manchester BY APPOINTMENT. *Telephone: Gatley* 2231 (3 lines).

CAMBERWELL HOUSE, 33, Peckham Road, London, S.E.5

Telegrams: "PSYCHOLIA, LONDON." *Telephone:* RODNEY 4242 (2 lines)

FOR THE TREATMENT OF MENTAL DISORDERS

Completely detached Villas for mild cases. Voluntary Patients received. Twenty acres of grounds; own garden produce. Hard and grass tennis courts, putting greens, Recreation Hall with Badminton Court, and all indoor amusements. Occupational therapy, Calisthenics, Actino-therapy, prolonged immersion baths, shock and also modified insulin treatment. Chapel.

Senior Physician, Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff and visiting Consultants.

An Illustrated Prospectus giving fees, which are strictly moderate, may be obtained upon application to the Secretary.

The Convalescent Branch is HOVE VILLA, BRIGHTON, and is 200 ft. above sea-level.

THE COTSWOLD SANATORIUM

First opened in 1898 and rebuilt in 1925 on the Cotswold Hills seven miles from Cheltenham, for the Treatment of Pulmonary and all other forms of Tuberculosis. Aspect S.S.W., sheltered from North and East, elevation 800 feet. Pure bracing air, SPECIAL TREATMENT by artificial PNEUMOTHORAX (X-ray controlled). TUBERCULINS, and ULTRA-VIOLET RAYS is available when necessary without extra charge. X-RAY plant, Fully Equipped Dental Department, Electric Light Radiators, hot and cold basins and Wireless in all rooms. Up-to-date drainage. Full day & night Nursing Staff. Terms: 5½ to 9½ Guineas a week inclusive.

Med. Supt.: GEOFFREY A. HOFFMAN, B.A., M.B., T.C. Dub. *Asst. Phys.:* MARGARET A. HARRISON, M.B., B.S. Lond. *Cons. Laryngologist:* G. N. BARKER, F.R.C.S. Edin., D.L.O. *Cons. Dent. Surgeon:* GEORGE V. SAUNDERS, L.D.S.R.C.S. Lond. *Phone:* 81 & 82 Witcombe. Apply: *The Secretary, The Cotswold Sanatorium, Cranham, Gloucester. Telegrams:* "Hoffman, Birdlip."

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FOR THE TREATMENT OF EIGHT LADIES, VOLUNTARY, TEMPORARY AND CERTIFIED PATIENTS

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FOR EARLY AND CONVALESCENT CASES Recreational Therapies are held daily by skilled Leaders

The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach. There is also a charming house, EBWORTHY, MANATON, DARTMOOR, situated in 20 acres, 1100 ft. up for bracing moorland air.

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P.

Telephones—STARCROSS 259 and TEIGNMOUTH 289

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Queen's Hospital for Children,

Hackney-road, London, E.2.

CASUALTY OFFICER (B2) required 1st October, 1941. Six months' appointment. R practitioners now holding A posts are invited to apply. Salary, including certain additions, will amount to not less than £150 per annum, with board, lodgings, and laundry in each case. Candidates must be prepared to participate in Medical Service Hospital arrangements in connexion with which beds have been reserved.

Applications must be made on form to be obtained from the undersigned, and be sent in, with copies of not more than three testimonials, on or before 22nd September, 1941.

CHARLES H. BESSELL, Secretary.

Royal London Ophthalmic Hospital

(MOORFIELDS EYE HOSPITAL), City-road, E.C.1.

Applications are invited for the post of FIRST ASSISTANT MEDICAL OFFICER to attend on Tuesdays and Fridays (mornings) each week.

Candidates must be registered medical practitioners.

Medical Officers will be required to assist the Honorary Surgeon and in his absence to take full charge of the work of the Clinic.

Salary will be paid at the rate of £1 5s. per session.

Applications, with testimonials, stating age and qualifications, must be received by the undersigned not later than the 20th September, 1941. A. J. M. TARRANT, Secretary.

East End Maternity Hospital.

APPOINTMENT OF RESIDENT MEDICAL OFFICER (B1).

Applications are invited from registered medical practitioners for appointment as Resident Medical Officer to the above hospital (now evacuated to Tyringham House, Newport Pagnell, Bucks). Suitably qualified R practitioners holding B2 or B1 posts may apply. The appointment will commence on 1st October, 1941, and will be in the first instance for six months with probability of reappointment. Applicants should have had post-graduate midwifery experience. There is ample time for further study. Salary at the rate of £250, together with board and residence at the hospital.

Applications, with copies of three recent testimonials, should be sent to— Miss BRUCE, Secretary.

396, Commercial-road, London, E.1.

Applications are invited from fully

qualified Medical Women for the following posts :—

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1.

A post: One RESIDENT HOUSE SURGEON for a period of six months.

OSTER HOUSE HOSPITAL, St. Albans.

A posts: Two RESIDENT HOUSE SURGEONS for a period of six months, work commencing 1st November, 1941.

Salaries will be pooled under the Medical Services Scheme and allocated according to experience, with a minimum of £100 per annum. Duties to commence 1st November, 1941.

Applications, with two copies of each of three testimonials, should be sent to the SECRETARY of The Elizabeth Garrett Anderson Hospital by 26th September, 1941.

Leeds Public Dispensary and Hospital.

Applications are invited from registered medical practitioners for the following resident posts, vacant from the 12th October next :—

RESIDENT SURGICAL OFFICER (B1).

Appointment for one year. Salary at the rate of £200 per annum, with residence, board, and laundry. Suitably qualified R practitioners holding B2 or B1 posts may apply.

TWO HOUSE PHYSICIANS (A).

Appointment for six months. Salary at the rate of £150 per annum, with residence, board, and laundry. R practitioners within three months of qualification may apply.

Applications, stating age, nationality, and qualifications, and accompanied by three recent testimonials, to be sent immediately to the undersigned.

CHARLES F. J. MAURY, Secretary and Superintendent.

The Nelson Hospital, Merton, S.W.20.

Applications are invited from registered medical practitioners for the appointment of Two RESIDENT HOUSE SURGEONS, Male (A), to become vacant on 1st October and 16th October respectively. R practitioners within three months of qualification may apply, when appointment will be for a period of six months; otherwise it will be for six months in the first instance. Salary at rate of £200 per annum, resident.

Applications, with copies of recent testimonials, should be sent to the SECRETARY forthwith.

St. Thomas's Hospital Medical School.

Applications are invited for the post of DEMONSTRATOR in the DEPARTMENT OF CHEMISTRY AND BIO-CHEMISTRY. Appointment for the duration of the war. Salary: Minimum £250 per annum, but according to experience.

Applications, giving full particulars and two references, should be made in writing to the DEAN, St. Thomas's Hospital Medical School, The Manor House, Godalming, Surrey, by Friday, 3rd October, 1941.

Warwickshire County Council.

DEPUTY COUNTY MEDICAL OFFICER OF HEALTH AND DEPUTY SCHOOL MEDICAL OFFICER (MALE).

Applications are invited from registered medical practitioners (Male), not over 45 years of age, holding the Diploma of Public Health, for the post of Deputy County Medical Officer of Health and Deputy School Medical Officer.

Previous administrative experience, particularly in connexion with first-aid and ambulance services and the Emergency Hospitals Scheme, will be considered an advantage.

The salary is at the rate of £850 per annum and the appointment is subject to the provisions of the Local Government Superannuation Act, 1937.

The person appointed will be required to use his own motor-car in the service of the Council and will be paid in respect of such use a mileage allowance in accordance with the Council's Scale from time to time in force. Subsistence allowances according to Scale will also be paid.

The appointment is subject to the production of a medical certificate in a form satisfactory to the County Medical Officer of Health.

Forms of application and statement of the duties and terms of appointment can be obtained from the County Medical Officer of Health, Shire Hall, Warwick, to whom applications, with copies of not more than three recent testimonials should be sent not later than Monday, the 6th October, 1941.

Canvassing directly or indirectly will be a disqualification.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 1st September, 1941.

Addenbrooke's Hospital, Cambridge.

Applications are invited from registered medical practitioners (unmarried), Male and Female, for the appointment of HOUSE SURGEON (A) to the EAR, NOSE, AND THROAT DEPARTMENT (38 Beds), including R practitioners within three months of qualification. In addition to the Ear, Nose, and Throat work, he or she will be responsible for a number of beds for general medical or surgical work. The appointment will commence on 1st November, 1941, and is for a period of six months, and at the end of such period continuation of the appointment can be considered. The appointment is terminable at any time by one month's written notice on either side. Salary at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Wednesday, 24th September, 1941.

J. A. BEARDSALL, Secretary-Superintendent.

The Bolton Royal Infirmary.

(245 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (B2), to become vacant on 10th October, including R practitioners who now hold A posts, when appointment will be limited to six months. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

H. AUBREY FROGGATT, Superintendent Secretary.

Christie Hospital and Holt Radium

INSTITUTE, WITHINGTON, MANCHESTER, 20.

APPOINTMENT OF RESIDENT MEDICAL OFFICER (B2)

Applications are invited from registered medical practitioners, Male or Female, for the appointment of Resident Medical Officer to the above Hospital and Institute for duty with the Radio-Therapy Department to become vacant on 1st October, 1941, including R practitioners who now hold A posts, when appointment may be limited to six months, otherwise it may be extended. The salary is at the rate of £150 per annum, with full residential emoluments, rising to £200 per annum at the end of six months.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

PERCY N. GLASS, Superintendent.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

County Borough of Huddersfield.

APPOINTMENT OF ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from registered medical practitioners (Ladies) who have had special experience in antenatal work and in the care of infants. Salary £500–£25–£700, initial salary according to experience. The doctor appointed will be required to reside in the Princess Royal Maternity Home, and a deduction will be made from the salary for board, &c. This post will be designated under the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination before being appointed to the position.

Applications, stating age, full particulars regarding training, qualifications, and appointments held since qualifications should be forwarded to the Medical Officer of Health, Public Health Department, Huddersfield, along with copies of two recent testimonials, so as to reach him not later than Thursday, 18th September, 1941. Application forms are NOT provided.

SAMUEL PROCTER, Town Clerk.

Town Hall, Huddersfield, September, 1941.

Hampshire County Council.

ASSISTANT COUNTY MEDICAL OFFICER

Applications are invited for the appointment of Assistant County Medical Officer. Candidates should have the D.P.H. or its equivalent and experience in County Council work, particularly in connexion with tuberculosis, would be an advantage. Salary £600 a year, rising on approved service to £750, subject to superannuation deductions, with travelling allowances.

Applications, on a form which can be obtained from the County Medical Officer, The Castle, Winchester, should reach him not later than the 27th September, 1941.

F. V. BARBER, Clerk of the County Council.

The Castle, Winchester, 9th September, 1941.

Scarborough Hospital.

(140 Beds.)

Applications are invited from registered medical practitioners (Female) for the following posts: HOUSE PHYSICIAN and Two HOUSE SURGEONS, all being category A. Appointment is for six months, beginning 1st November, 1941. Salary at the rate of £150 per annum, together with board, residence, laundry, &c.

Applications, stating age and experience, together with copies of not more than three recent testimonials, to be sent to the HON. SECRETARY not later than the first post 29th September, 1941.

York Dispensary.

Applications are invited for the post of RESIDENT MEDICAL OFFICER (Female) to commence duties as soon as possible. The duties consist chiefly in visiting and attending the sick poor in their own homes and in assisting the Honorary Medical Staff. Candidates must be duly qualified, registered, and unmarried. Experience in the administration of anæsthetics is essential. Salary £220 per annum, with board, lodging, and laundry. There is a substantial car allowance should the successful applicant be possessed of and wish to use own car.

Applications, with testimonials, to be sent to me on or before Monday, 22nd September, 1941.

JOHN C. PETERS, Secretary.

4, New-street, York, 2nd September, 1941.

Wrexham and East Denbighshire

WAR MEMORIAL HOSPITAL. (248 Beds.)

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the appointment of RESIDENT HOUSE SURGEON (A). The appointment is for a period of six months. Salary £150 per annum, with full residential emoluments.

Applications, stating age, nationality, experience, and qualifications, with copies of three recent testimonials, to be sent to the undersigned immediately.

LESLIE SPENCER, Secretary.

Victoria Hospital, Blackpool.

(200 Beds.)

DEPUTY ASSISTANT RADIOLOGIST required for part-time service at the Hospital and part-time service in the private practice of the Honorary Radiologist. The appointment is for twelve months, or the duration of the war, whichever period is the shorter. Salary at the rate of £400 per annum. Preference will be given to a practitioner with a special diploma in Radiology.

Applications, giving full particulars, should be addressed to—

THE GENERAL SUPERINTENDENT.

Royal Isle of Wight County Hospital,

RYDE.

APPOINTMENT OF A HOUSE SURGEON (B2).

Applications are invited from registered medical practitioners, Female, for the appointment of a House Surgeon (B2) to become vacant on 1st October next. The appointment will be for six months. Salary at the rate of £180 a year, with board, residence, and laundry. As this is the senior post, previous surgical experience is advisable.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned without delay.

A. S. GORDON, Secretary.

Bootle General Hospital,

Linacre-lane, BOOTLE, LIVERPOOL, 20.

(123 Beds.)

HOUSE PHYSICIAN.

Applications are invited from registered medical practitioners, Male and Female, for the above A appointment, including R practitioners within three months of qualification. Appointment is for six months from 1st October, 1941, and salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with details, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

A. J. COOPER, Secretary-Superintendent.

Southend-on-Sea General Hospital.

Applications are invited from registered medical practitioners, Male, for the appointment of a HOUSE PHYSICIAN (A), with some Casualty duties, to become vacant on 1st October, 1941, including R practitioners within three months of qualification, when the appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 22nd September.

P. H. CONSTABLE, Secretary.

Liverpool Eye, Ear and Throat

INFIRMARY.

ORTHOPTIST.

Applications are invited for the post of Orthoptist at the above Infirmary. Applicants must be fully qualified and certificated.

Applications, stating experience and age, with copies of three testimonials, should be forwarded to the undersigned immediately

W. LEAR, Secretary.

Taunton and Somerset Hospital,

TAUNTON.

HOUSE SURGEON (A).

Applications are invited from registered medical practitioners for the appointment of a House Surgeon (A), to become vacant at the end of October, including R practitioners within three months of qualification. Appointment for six months. Salary at rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of testimonials, to be sent to F. J. J. STACEY, Secretary.

Derbyshire County Council.

DERBYSHIRE SANATORIUM, Near CHESTERFIELD.

TEMPORARY JUNIOR RESIDENT ASSISTANT MEDICAL OFFICER (B1) (MALE OR FEMALE).

Applications are invited from registered medical practitioners for the appointment of a Temporary Junior Resident Assistant Medical Officer at the Derbyshire County Sanatorium. Applicants should have held house appointments and previous experience of tuberculosis will be preferred. Experience of artificial pneumothorax work will be considered an additional qualification. Candidates must be single (suitably qualified R practitioners holding B2 or B1 appointments are invited to apply). Salary at the rate of £350 per annum, rising by annual increments of £25 to £450 per annum, together with board, lodging, &c. The successful candidate will devote the whole of his (or her) time to the duties of the office. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the person appointed will be required to pass a medical examination.

Application forms may be obtained from the undersigned, to whom they must be returned, together with copies of not more than three recent testimonials, on or before 29th September, 1941. The appointment will be terminated by one month's notice on either side.

W. M. ASH, County Medical Officer.

New County Offices, Derby, 5th September, 1941.

City and County of Bristol.

DEPARTMENT OF PUBLIC HEALTH.

HAM GREEN HOSPITAL AND SANATORIUM.

APPOINTMENT OF ASSISTANT RESIDENT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners for the appointment of an Assistant Resident Medical Officer. Applicants should have held house appointments. Applicants can include R practitioners who now hold A posts, when appointment will be limited to six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned forthwith.

R. H. PARRY, Medical Officer of Health.

Department of Public Health, Kenwith Lodge, Westbury Park, Bristol, 6, 6th September, 1941.

Borough of Accrington.

APPOINTMENT OF DEPUTY MEDICAL OFFICER OF HEALTH.

Applications are invited from registered medical practitioners of either sex holding a Diploma in Public Health for the post of Deputy Medical Officer of Health and School Medical Officer to the Borough of Accrington. The appointment will, in the first place, be a temporary one for the duration of the war, but it is expected that at the close of hostilities a permanent appointment to the post will be made, and the temporary holder of the post will be eligible for consideration for such permanent appointment.

The commencing salary of the post is £500 per annum, rising by annual increments of £25 to £700 per annum. There is in addition a cost-of-living bonus which at present amounts to £24 per annum.

The successful candidate will be required to live within the Borough and to undertake, under the direction of the Medical Officer of Health, clinical and administrative duties in all branches of Public Health work.

Applications must be received not later than Monday, 29th September, by the undersigned, from whom a form of application, together with full particulars of the duties and terms of the appointment, may be obtained.

W. H. WARHURST, Town Clerk.

Town Hall, Accrington, September, 1941.

Children's Hospital, Nottingham.

Applications are invited for the post (B1) of HOUSE PHYSICIAN (Woman). The salary will be at the rate of £220 per annum, with apartments, board, and laundry. The appointment will be for six months, duties to commence on the 1st November, 1941.

Applications, together with testimonials, stating age, nationality, qualifications, and experience, to be sent to the HONORARY SECRETARY, 1, King John's Chambers, Bridlesmith Gate, Nottingham, on or before Tuesday, 23rd September, 1941. Selected candidates will be required to attend at the Hospital for a personal interview.

Northampton General Hospital.

(405 Beds.)

Applications are invited immediately from registered medical practitioners for the appointments of CASUALTY OFFICER (A) and HOUSE PHYSICIAN (A). R practitioners within three months of qualification may apply, when appointments will be for a period of six months. Salary at the rate of £150 per annum, with board, residence, and laundry.

Applications, stating age, qualifications with dates, nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

GORDON S. STURTRIDGE, M.B., B.S., Superintendent.

3rd September, 1941.

City of Manchester.

LANGHO COLONY FOR SANE EPILEPTICS.

APPOINTMENT OF MEDICAL SUPERINTENDENT.

The Public Health Committee invite applications from registered medical practitioners for the position of Medical Superintendent of the Langho Colony for Sane Epileptics, near Blackburn, Lancashire. The Colony contains 640 Beds and admits both male and female sane epileptics. Age limit 45 years. Candidates should be experienced physicians with hospital administrative experience. Importance will be attached to previous experience in the treatment of epileptics and mental disease. Possession of the Diploma in Psychological Medicine is desirable, and a capacity for research work will be an additional qualification. Salary £1050 per annum, rising to £1100 per annum after two years' service, less £116 per annum for unfurnished residence, &c.

Full particulars, together with forms of application, may be obtained from the Medical Officer of Health, Box 399, Town Hall, Manchester, 2, and completed applications must be received by him not later than 1st October, 1941. Endorse inquiries "Medical Superintendent."

Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 6th September, 1941.

Royal Berkshire Hospital, Reading.

Applications are invited from registered medical practitioners (Male) for the following appointments, which fall vacant on the dates stated:—

HOUSE SURGEON (A) to the OBSTETRIC AND GYNÆCOLOGICAL DEPARTMENTS—26th September, 1941;

HOUSE SURGEON (A) to the SPECIAL DEPARTMENTS—29th October, 1941;

HOUSE PHYSICIAN (A)—immediately;

including R practitioners within three months of qualification. These appointments are for six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, to be sent to the undersigned immediately.

H. E. RYAN, Secretary and House Governor.

Royal Halifax Infirmary.

Applications are invited from registered medical practitioners (Male) for six months from 1st October, 1941, including suitably qualified R practitioners holding A posts, for:—

(1) HOUSE PHYSICIAN (B2). Salary £175 per annum;

and R practitioners within three months of qualification for:—

(2) SECOND HOUSE SURGEON (A). Salary £175 per annum;

(3) CASUALTY OFFICER (A). Salary £150 per annum.

All appointments include full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

5th September, 1941. A. MIDGLEY, Secretary.

Pembroke County War Memorial

HOSPITAL, HAVERFORDWEST.

(182 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, when appointment will be for a period of six months, for the appointment of a HOUSE SURGEON (A), to become vacant on 1st October. Salary is at the rate of £200 per annum, with full residential emoluments (Private Bungalow).

Applications, stating age, qualifications with dates, and nationality, and accompanied by three testimonials, should be sent to the undersigned. B. GLANVILLE DAVIES, Secretary.

Victoria Hospital, Accrington.

APPOINTMENT OF HOUSE SURGEON (A)

Applications are invited from registered medical practitioners, Male, for the appointment of HOUSE SURGEON (A) to become vacant 1st November, including R practitioners within three months of qualification, when appointment will be for a period of six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by three recent testimonials, should be sent to the undersigned immediately.

W. H. WARHURST, LL.B., Hon. Secretary.

The Prince of Wales's Hospital,

Greenbank-road, PLYMOUTH.

Applications are invited from registered medical practitioners for the appointments of two HOUSE SURGEONS (A), one post vacant forthwith and one post vacant on 1st November, including R practitioners within three months of qualification, when appointments will be for a period of six months. Salaries are at the rate of £132 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 4th October.

ARTHUR R. CASH, General Superintendent.

County Borough of St. Helens.

TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH (MALE OR FEMALE).
(Replacement of Staff on Military Service.)

Applications are invited for the post of Temporary Assistant Medical Officer of Health (Male or Female).

The duties will be mainly in connexion with the school medical service and maternity and child welfare, but frequently include infectious diseases, tuberculosis, and general sanitary work, so that the post gives considerable general experience.

The salary will be at the rate of £500 per annum, rising by annual increments of £25 to a maximum of £700 per annum, plus travelling expenses or in lieu a motor-car allowance at present at the rate of £50 per annum. The salary is at present subject to a temporary war cost-of-living bonus at the rate of 6 per cent. on the first £300 and 3 per cent. on the next £200 or part.

In the case of a candidate now in the service of another authority on a rising scale, recognition may be given to past service with such authority in fixing the commencing salary.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Forms of application may be obtained from the Medical Officer of Health, Town Hall, St. Helens, and completed applications, accompanied by copies of not more than three recent testimonials, should reach him not later than the 20th September, 1941.

Canvassing members of the Council or Committees of the Corporation will be a disqualification.

FRANK HAUXWELL, Medical Officer of Health.

Town Hall, St. Helens, 29th August, 1941.

Derbyshire County Council.

BRETBY HALL ORTHOPÆDIC HOSPITAL. (147 Beds.)

TEMPORARY JUNIOR RESIDENT ASSISTANT MEDICAL OFFICER (B1).

Applications are invited for the post of Temporary Junior Resident Assistant Medical Officer at the above Institution. Candidates must have had previous orthopædic experience and should be competent anæsthetists. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £350 per annum, rising by annual increments of £25 to £450 per annum, with board, residence, and laundry. The successful candidate will devote the whole of his time to the duties of his office. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the person appointed will be required to pass a medical examination.

Application forms may be obtained from the undersigned, to whom they must be returned, together with copies of not more than three recent testimonials, on or before 22nd September, 1941. The appointment will be terminated by one month's notice on either side. W. M. ASH, County Medical Officer.

New County Offices, Derby, 1st September, 1941.

Hampshire County Council.

ALVERSTOKE HOSPITAL, CLAYHALL ROAD, GOSPORT (64 Beds.)

APPOINTMENT OF ASSISTANT RESIDENT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners (Male or Female) for the appointment of an Assistant Resident Medical Officer (B2), including R practitioners who now hold A posts, when appointment will be limited to six months. Otherwise it will be for the duration of the war. The salary is at the rate of £350 per annum; one month's notice on either side.

Applications, stating age, qualifications with dates, nationality and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 22nd September, 1941.

H. LESLIE CRONK, County Medical Officer.

The Castle, Winchester.

Nottingham and Midland Eye INFIRMARY.

Applications are invited from registered medical practitioners Male and Female, for the post of RESIDENT HOUSE SURGEON (B2), to become vacant on 9th October, including R practitioners who now hold A posts when appointment will be limited to six months. Salary £200 per annum, with full residential emoluments. Large out-patient department. Post recognised D.O.M.S.

Applications, stating age, qualifications, and nationality, with copies of three recent testimonials, to the undersigned forthwith.

T. RUSSELL MOORE, Secretary.

The Ropewalk, Nottingham.

Victoria Hospital, Burnley.

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from registered medical practitioners, Male and Female, for the appointment of House Surgeon (A), to become vacant immediately, including R practitioners within three months of qualification, when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

J. E. WHEATCROFT, Secretary.

City of Portsmouth.

TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited for the appointment (temporary) of an Assistant Medical Officer of Health (Male or Female) for duties in connexion with the Casualty Services' Section of the A.R.P. Scheme and the Public Health Department of Portsmouth. The officer appointed will be required to assist the Medical Officer of Health in the organisation of the casualty services and to carry out such other general public health duties as the Medical Officer of Health may direct. Previous experience in air-raid precautions work and the possession of a Diploma in Public Health, though desirable, are not essential.

The salary will be at the rate of £600 per annum, and the appointment will be terminable, at any time, by one month's notice on either side.

Forms of application may be obtained from and must be returned to the Medical Officer of Health, Royal Beach Hotel, Portsmouth, not later than 22nd September, 1941, together with three copies of recent testimonials.

Canvassing, either directly or indirectly, will be deemed a disqualification. F. J. SPARES, Town Clerk.

The Royal Beach Hotel, Portsmouth.

Coventry and Warwickshire Hospital.

(Out-patient Department in Coventry; In-patient accommodation in Medical and Surgical Branches outside the City.)

APPOINTMENT OF CASUALTY OFFICER (B2).

Applications are invited from registered medical practitioners, Male and Female, for the above appointment, including R practitioners who now hold A posts. If held by an R practitioner the appointment will be limited to six months. Salary at the rate of £150 per annum, with full residential emoluments. The appointed candidate will be expected to take up duty any time during the month of October.

APPOINTMENT OF TWO HOUSE SURGEONS (A).

Applications are invited from registered medical practitioners, Male and Female, for the above appointments, including R practitioners within three months of qualification. If held by an R practitioner the appointment will be for a period of six months. The appointed candidates will be expected to take up duties during the month of October. Salary at the rate of £150 per annum, with full residential emoluments.

Applications for all the above posts, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of not more than three recent testimonials, should be addressed to the HOUSE GOVERNOR AND SECRETARY, Coventry and Warwickshire Hospital, Coventry.

The Bolton Royal Infirmary.

(245 Beds).

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A) to become vacant on 1st October, 1941, including R practitioners within three months of qualification. Appointment is for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

H. AUBREY FROGGATT, Superintendent Secretary.

East Suffolk and Ipswich Hospital.

(400 Beds—8 Residents.)

Applications are invited from registered medical practitioners (including R practitioners within three months of qualification) for the appointment of HOUSE SURGEON (A) to the Gynæcologist, to become vacant on 1st October. Appointment will be for six months. Salary at the rate of £144 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be sent to the undersigned.

ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 6th September, 1941.

Manchester Royal Eye Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A) now vacant, including R practitioners within three months of qualification, when appointment will be for a period of six months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

R. R. NORTH, General Superintendent and Secretary.

Applications are invited for the post of OUT-PATIENTS' MEDICAL OFFICER. Successful candidates will be required to undertake morning work in the Out-patient Department. Applicants must be registered medical practitioners and possess a good knowledge of refraction work. Salary £200 per annum, six mornings per week.

Applications, giving qualifications and age, accompanied by three recent testimonials, should be sent to the GENERAL SUPERINTENDENT AND SECRETARY, MANCHESTER ROYAL EYE HOSPITAL.

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Grimsby and District Hospital.

APPOINTMENT OF RESIDENT CASUALTY OFFICER (A)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the post of Resident Casualty Officer (A). Appointment is limited to six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by three recent testimonials, should be sent to the undersigned at once.

H. B. COATES, Secretary-Superintendent.

Grimsby and District Hospital.

APPOINTMENT OF RESIDENT ORTHOPÆDIC OFFICER (B2).

Applications are invited from registered Male medical practitioners for the appointment of Resident Orthopædic Officer. Applicants should have held house appointments and had experience in orthopædic and fracture work. Duties to commence on 1st October. R practitioners who hold A posts may apply. The appointment will be limited to six months, and salary is at the rate of £275 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by copies of three recent testimonials, should be sent to the undersigned at once.

H. B. COATES, Secretary-Superintendent.

1st September, 1941.

Buckinghamshire County Council.

APPOINTMENT OF TEMPORARY ASSISTANT MEDICAL OFFICER.

Applications are invited for the post of whole-time Temporary Assistant Medical Officer at a salary of £600, rising by annual increments of £25 to a maximum of £700, with travelling and subsistence allowances on the County Council scale. The successful candidate will be required to pass a medical examination and to contribute to the superannuation scheme under the Local Government Superannuation Act, 1937. The officer appointed will be required to undertake duties in connexion with general public health and A.R.P. Possession of a Diploma in Public Health or its equivalent will be an advantage.

Forms of application and particulars of duties may be obtained from the undersigned, and after completion must be returned to the County Medical Officer, County Hall, Aylesbury, together with copies of not more than three recent testimonials, by 22nd September, 1941.

GUY R. CHOUCH, Clerk of the Bucks County Council.

County Hall, Aylesbury, 2nd September, 1941.

West Sussex County Council.

ST. RICHARD'S HOSPITAL, CHICHESTER.

APPOINTMENT OF RESIDENT MEDICAL OFFICER (B1).

Applications are invited from registered medical practitioners (Male) for the post of Resident Medical Officer at St. Richard's Hospital, Chichester (678 Beds), in connexion with the Emergency Hospital Scheme. Post-graduate experience in casualty and clinical work is essential, and candidates should have had at least twelve months' experience since qualification. Preference will be given to candidates holding one of the higher qualifications. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £350 per annum, with full board, lodging, and laundry.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, accompanied by copies of not more than three recent testimonials, should be sent to the undersigned not later than 19th September, 1941.

T. C. HAYWARD, Clerk of the County Council.

County Hall, Chichester, 30th August, 1941.

The Gloucestershire Royal Infirmary AND EYE INSTITUTION, GLOUCESTER.

Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON (A) to the EAR, NOSE, AND THROAT DEPARTMENT which is now vacant, including R practitioners within three months of qualification. The appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned at once.

28th August, 1941. F. J. SYMONS, Secretary.

Dewsbury and District General INFIRMARY, DEWSBURY. (100 Beds.)

Applications invited for the post of SECOND HOUSE SURGEON (A) (Male), vacant early in October, including R practitioners within three months of qualification, when appointment will be for a period of six months. Salary £150 per annum, and emoluments. The duties are principally those of a House Physician and Casualty Officer. The Infirmary is a modern Voluntary Hospital with usual special departments staffed by Visiting Specialists.

Applications, stating age, qualifications with dates, and nationality, together with copies of recent testimonials, to be addressed to SECRETARY-SUPERINTENDENT as soon as possible.

Sudan Medical Service.

Applications are invited from medical Men for appointment to a vacancy in the Sudan Medical Service. Candidates must be British-born, single, under thirty years of age, and must have held a resident appointment in a large general hospital. Pay commences at £E.720 per annum (approximately £738 sterling), rising to £E.1,200 (approximately £1,230 sterling) after thirteen years' service. Senior posts are by selection. On confirmation of his appointment after two years, a candidate is eligible for pensionable service.

Application forms and all information can be obtained from the CONSULTING PHYSICIAN to the Sudan Government, 93, Harley-street, London, W.1.

Southern Rhodesia Medical Service. GOVERNMENT MEDICAL OFFICER.

Applications are invited from fully qualified, unmarried, Male medical practitioners with experience in Tropical Medicine, for appointment as Government Medical Officer in the Southern Rhodesia Government Medical Service. Salary will be on the scale £600 × £25–£750 per annum. There is also a senior grade (£750 × £25–£900) to which promotions are made as vacancies occur. Salary will commence from the date of assumption of duty in Southern Rhodesia. In addition, private practice is allowed. The successful applicants will be required to sign an agreement for three years' service in the first instance, and thereafter may make application to be placed on the pensionable establishment. A free second-class steamship passage to Cape Town and first-class railway ticket thence to Southern Rhodesia will be provided. Canvassing, either directly or indirectly, will disqualify applicants. The applicants should state the date on which they would be prepared to leave England if appointed.

Applications, stating age, qualifications and experience, together with copies of testimonials, should reach the OFFICIAL SECRETARY, Office of the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W.C.2 (from whom further particulars and application form may be obtained) not later than 20th September, 1941.

Royal Victoria Hospital, Belfast.

RESIDENT BIOCHEMIST for the above Institution. Salary £200 per annum, eligible for re-election with an increase of £50 in the second year. The appointment to date from 1st October, 1941.

Applications, with copies of testimonials, to be forwarded to the Superintendent, not later than 10 A.M. on Monday, 22nd September, 1941.

The Election will take place at the meeting of the Board of Management on Wednesday, 1st October, 1941, at 4.15 P.M. Canvassing forbidden.

By Order,
J. S. ROGERS, Hon. Sec.

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